RED ROCK/LIMA WATERSHED ENVIRONMENTAL ANALYSIS

Environmental Assessment DOI-BLM-MT-B050-2018-0009-EA

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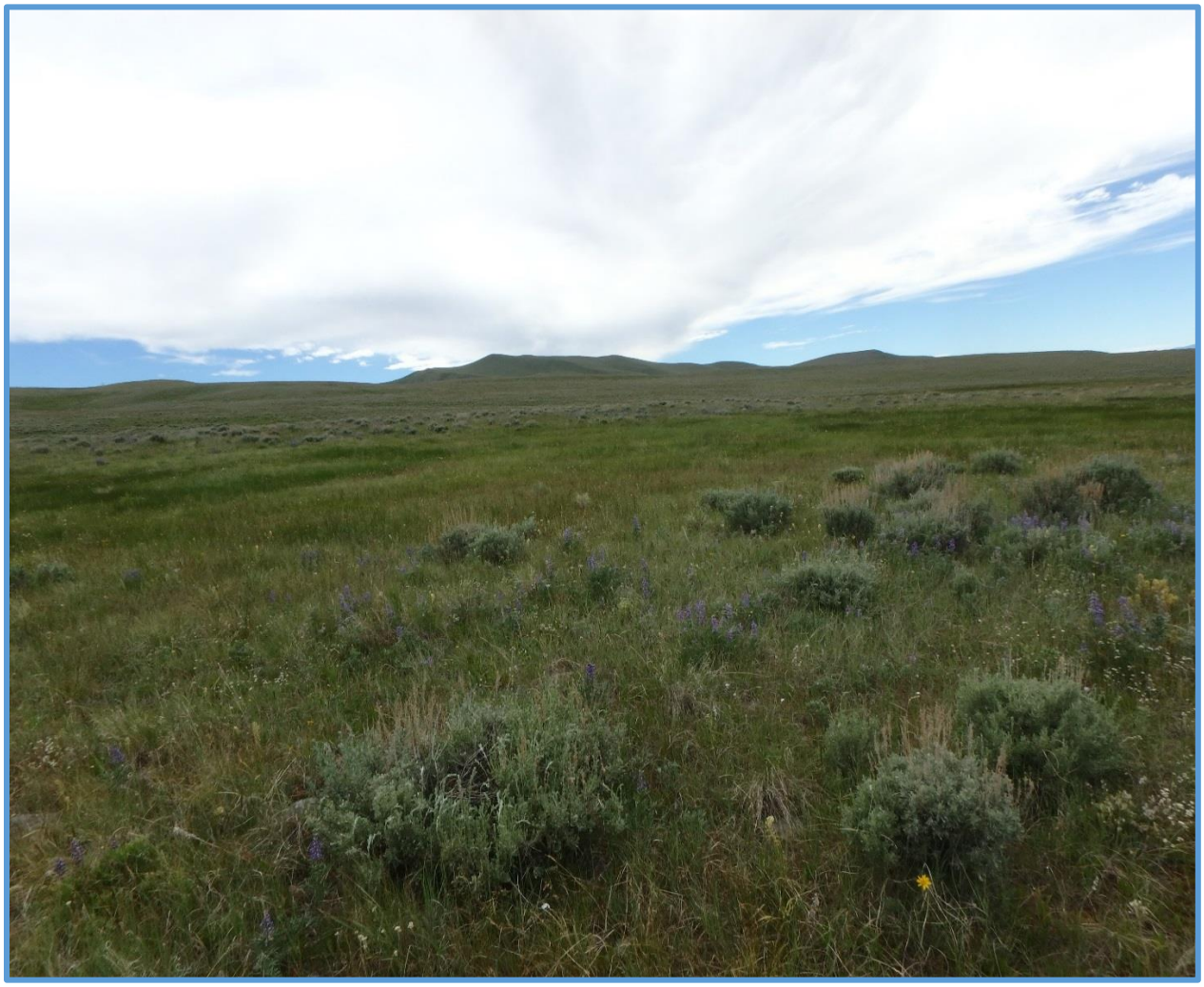

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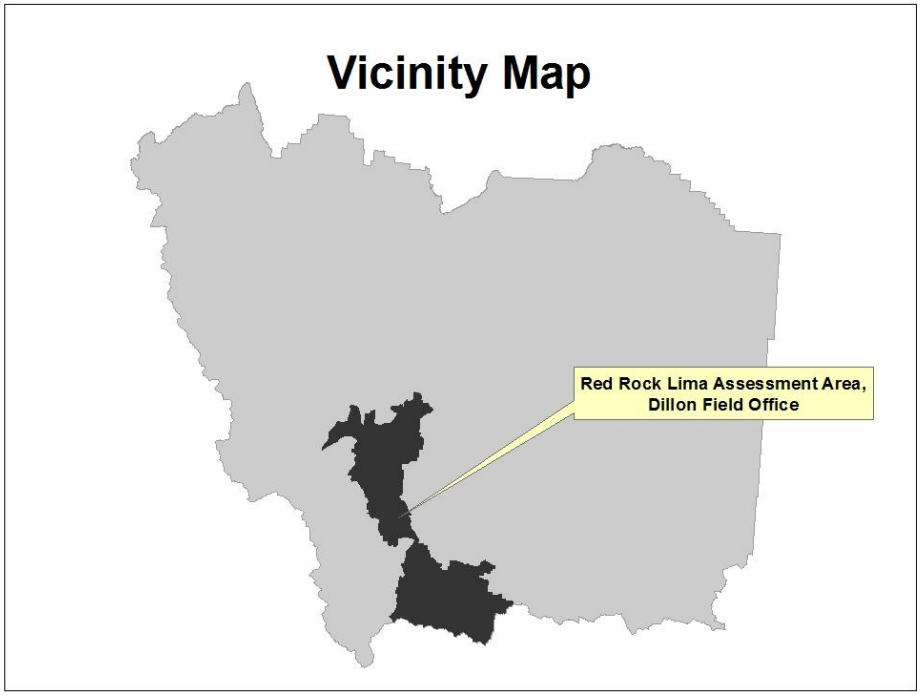
Introduction & Background

The Red Rock/Lima Watershed (RRLW) is located in southern Beaverhead County, Montana. The watershed lies in Townships 8-16 South, Ranges 6-12 West, Montana Principal Meridian (M.P.M). The RRLW follows the I-15 corridor from the Barrett's exit south of Dillon, Montana south to the Montana/Idaho border near Monida, Montana. This assessment covers only BLM administered public lands in this area. The RRLW is primarily in the central portion of the 4th level Hydrologic Unit (HU) known as the Red Rock (10020001) used by the Montana Department of Environmental Quality (DEQ). The RRLW also overlaps a small portion of the Beaverhead HU (ID# 10020002). The current watershed boundary for the RRLW has been modified from the boundary area used during the 2007 watershed assessment process. Some areas have been removed, while other areas that were assessed as part of the Beaverhead West Watershed in 2007 were included into the RRLW. Additionally, during the Sage Creek Watershed planning process (2015-2016), a small portion of BLM land was administratively moved into the Red Rock Watershed from the Sage Creek Watershed, while some of the Red Rock Lima watershed was moved to the Sage Creek Watershed. The watershed boundary modification was an administrative remedy to improve efficiency of workloads and rangeland administration throughout the entire Dillon Field Office. Watershed Boundaries continue to follow grazing allotment boundaries, not the HU watershed boundaries. The RRLW assessment area within the Dillon Field Office boundary is shown on the vicinity map below as well as Map 1 in appendix A.



Within the RRLW there are approximately 338,027 acres. Of these acres, 69,730 acres are BLM managed public land. This represents approximately 21 percent of the watershed. This Environmental Assessment (EA) addresses only the public lands administered by the BLM. There are also 80,948 acres (24% of the watershed) administered by the United States Forest Service (USFS), 9,500 acres (3% of the watershed) administered by the Bureau of Reclamation (BOR), 53,451 acres (16% of the watershed) administered by the Montana Department of Natural Resources and Conservation (DNRC), and 124,394 acres (37% of the watershed) of privately owned lands within the RRLW.

Elevations on BLM administered public land within the RRLW range from approximately 5,300 feet along the Beaverhead River at the north end of the watershed, to over 9,200 feet near the communications tower on Maurer Mountain, east of Clark Canyon Reservoir. Common with foothill/mountainous areas, the topography varies greatly. Flat to gently sloping uplands are commonly found along the Red Rock River valley. These areas typically receive 11-14 inches of precipitation annually. A majority of these lands are either privately owned or administered by the DNRC, however portions of the Clark Canyon, Williams, Roe West, Bell Canyon, North McKnight, and Norris Canyon allotments contain public lands on these flat to gently sloping rangelands. Foothills and mountain slopes are common within the RRLW and are found between the valley floors and alpine mountaintops. The foothills and mountain slopes typically receive between 12-16 inches of precipitation annually. Typically, these landforms are administered by either the BLM or the USFS, however significant tracts of private property occur within the foothills/mountain slopes areas within the RRLW. The mountain tops and alpine areas are primarily managed by either the BLM or USFS within the RRLW. Precipitation in these areas can range from 16-22 inches annually.

In 2017, a BLM interdisciplinary team (IDT) assessed the land health of BLM administered land in the RRLW. The ID team assessed the following five Rangeland (Land) Health Standards: Upland Health, Riparian Health, Water Quality, Air Quality, and providing for biodiversity. The Watershed Assessment Report reported the condition/function of resources within the assessment area to the Authorized Officer. The Authorized Officer considered the Assessment Report to determine whether Land Health Standards (Standards) were met. The Assessment Report was completed and released to the pubic in December 2017 and is available at the Dillon Field Office.

Condition/function declarations regarding the Standards are made as either:

- Proper Functioning Condition (PFC)
- Functioning at Risk (FAR); which is assigned a trend of up, down, static, or not apparent, or
- Nonfunctioning (NF)

Land Health Standards are met when conditions across an allotment as a whole are at PFC or FAR with an apparent trend. BLM's regulations at 43 CFR 4180.1 require that an authorized officer take appropriate action as soon as practicable but not later than the start of the next grazing year upon determining that existing grazing management needs to be modified to ensure that… "watersheds are in or making significant progress toward properly functioning physical condition." As such, in the judgement of BLM's resource specialists and the authorized officer, a stream reach may be determined to be meeting the Riparian Standard if the stream reach is

determined to be either: (1) in PFC, or (2) "making significant progress" toward PFC (FAR with and upward trend). This is dependent on scope and scale and determined by the Authorized Officer. The Determination of Standards has been completed and is being mailed to the public along with this EA.

The assessed condition/function and recommendations in the Assessment Report and Determination of Standards, along with comments received through public scoping have been used to develop alternatives to initiate progress towards Proper Functioning Condition and address site specific resource concerns where needed. This EA was completed in accordance with established procedures to analyze and implement area, allotment, or site specific management changes.

By working on a watershed basis, a broader landscape is considered and more consistent management can be applied. It is the BLM's intent to implement watershed management cooperatively. Any changes in livestock management will be implemented through decisions that address allotments or groups of allotments with a common permittee/lessee. Wildlife and fisheries habitat management, vegetative treatments or projects and/or changes to travel management will be implemented through decisions appropriate for the respective programs.

The 2006 Dillon RMP as amended provides guidance for all programs in the Dillon Field Office.

Purpose and Need

The alternatives proposed in this EA are intended to maintain or improve land health standards where they were met, and to improve land health standards and enhance biodiversity where standards were not met, while maintaining the BLM's multiple use mandate by:

- Restoring, improving and/or maintaining riparian, wetland, and aquatic health through revised livestock grazing management, construction and/or maintenance of structural projects, road maintenance, stream crossing improvements and/or implementing vegetative treatments.
- Maintaining and/or enhancing upland health including sagebrush steppe habitat (species composition and structure) through revised livestock grazing management, construction, maintenance or modification of structural projects, and/or vegetation treatments.
- Restoring and/or maintaining historic density, structure, and species composition of forest and woodland habitats through mechanical and chemical treatments, and/or prescribed fire.
- Eradicating new and containing/controlling existing noxious weed and invasive species infestations as well as preventing the spread of noxious and invasive species.
- Mitigating resource impacts from recreation activities while providing access to public lands through modifications to motorized travel route designations.

Additionally, the purpose is for the BLM to renew term grazing permits/leases as mandated by legislation from the Taylor Grazing Act of 1934 and the Federal Land Management Policy Act of 1976.

The need for the actions proposed in this EA is in direct response to land health conditions/function and recommendations identified in the RRLW Assessment Report. In that document, the IDT described several causal factors, which, when combined, negatively impact

the biological, physical, and/or ecological processes within specific areas or allotments within the watershed. As a result, the Authorized Officer determined that one or more Standards are not met in 3 of the 28 grazing allotments.

The Fundamentals of Rangeland Health and Land Health Standards require the BLM to initiate management actions that ensure, "Watersheds are in, or making significant progress toward, properly functioning condition, including their upland, riparian-wetland, and aquatic components," if an assessment determines that one or more of the Land Health Standards are not being met (43 CFR 4180.1(a)).

TABLE 1.1: DETERMINATION OF STANDARDS BY ALLOTMENT

Allotment Name, Number, Category and BLM Acres	Are Healthy Rangeland Standards Being Met?					Contributing factors in failing to meet Standards and summary of resource concerns.
	Upland	Riparian Wetland	[1]Water Quality	Air Quality	Bio-diversity	
Allotment E 10149 (C) Acres: 1,550	Yes	N/A	N/A	Yes	Yes	Standards Achieved; concerns about upland plant composition/vigor. Concerns with leafy spurge found in the southeast corner of the allotment.
Bell Canyon 20193 (I) Acres: 8,576	Yes	Yes	Yes	Yes	Yes	Standards Achieved; concerns about plant composition/ invasive species. Concerns with knapweed and cheatgrass infestations.
Cedar Creek 10124 (I) Acres: 4,664	Yes	Yes	Yes	Yes	Yes	Standards Achieved; Concerns about sediment delivery into riparian from roads. Concerns about the leafy spurge in a draw in section 35.
Clark Canyon 30002 (I) Acres: 8,557	Yes	Yes	Yes	Yes	Yes	Standards Achieved; concerns about plant composition in State-Buck pasture and impacts to riparian from irrigation practices. Forest health concerns including forest densities, aspen decline, and insect and disease levels.
Clark Canyon Isolated 20206 (C) Acres: 140	Yes	No	No	Yes	Yes	Standards #2 and #3 Not Achieved; Impacts to riparian and water quality from channel alterations

Allotment Name, Number, Category and BLM Acres	Are Healthy Rangeland Standards Being Met?					Contributing factors in failing to meet Standards and summary of resource concerns.
	Upland	Riparian Wetland	[1]Water Quality	Air Quality	Bio-diversity	
						related to irrigation practices.
Gallagher 20114 (M) Acres: 5,023	Yes	Yes	Yes	Yes	Yes	Standards Achieved; Concerns about livestock, road impacts to reach 14, and travel management (road braiding near mouth of Gallagher Creek). Concerns about houndstongue and spotted knapweed in the lower reaches of Gallagher Creek.
Gallagher Mountain AMP 30013 (I) Acres: 9,460	Yes	Yes	Yes	Yes	Yes	Standards Achieved; Concerns about livestock impacts to riparian on reach 80.
Lima Peaks 30270 (M) Acres: 1,542	Yes	Yes	Yes	Yes	Yes	Standards Achieved; concerns about historic mining impacts to reach 913
Little Sheep 10622 (C) Acres: 120	Yes	Yes	Yes	Yes	Yes	Standards Achieved
Lovell's Lake 30605 (C) Acres: 186	Yes	N/A	N/A	Yes	Yes	Standards Achieved
Norris Canyon 20109 (M) Acres: 321	Yes	N/A	N/A	Yes	Yes	Standards Achieved; Concerns about low plant vigor.
North McKnight 20746 (I) Acres: 2,242	Yes	N/A	N/A	Yes	Yes	Standards Achieved
Phalarope West 30204 (C) Acres: 1,029	Yes	N/A	N/A	Yes	Yes	Standards Achieved
Pinetop Hill 03192 (C) Acres: 48	Yes	Yes	Yes	Yes	Yes	Standards Achieved

Allotment Name, Number, Category and BLM Acres	Are Healthy Rangeland Standards Being Met?					Contributing factors in failing to meet Standards and summary of resource concerns.
	Upland	Riparian Wetland	[1]Water Quality	Air Quality	Bio-diversity	
Radio TV 00150 (M) Acres: 1,830	Yes	N/A	N/A	Yes	Yes	Standards Achieved; Concerns about conifer encroachment and noxious weeds.
Roe 20727 (M) Acres: 2,555	Yes	Yes	Yes	Yes	Yes	Standards Achieved; Concerns with scattered spotted knapweed infestations.
Roe Isolated 20729 (C) Acres: 85	Yes	Yes	Yes	Yes	Yes	Standards Achieved
Roe West 20728 (M) Acres: 4,492	Yes	N/A	N/A	Yes	Yes	Standards Achieved
Seybold Individual 20686 (C) Acres: 160	Yes	N/A	N/A	Yes	Yes	Standards Achieved
Seybold Non-AMP 20187 (C) Acres: 80	Yes	N/A	N/A	Yes	Yes	Standards Achieved
Shoshone Cove 20192 (M) Acres:1,671	Yes	N/A	N/A	Yes	Yes	Standards Achieved
Slanger 20712 (C) Acres: 308	Yes	N/A	N/A	Yes	Yes	Standards Achieved
Snowline AMP 30029 (I) Acres: 9,445	Yes	No	No	Yes	Yes	Standard #2 & 3 Not Achieved; Impacts to riparian from current livestock grazing.
Snowline AMP Custodial 20607 (C) Acres: 1,453	Yes	No	No	Yes	Yes	Standard #2 & 3 Not Achieved; Impacts to riparian from historic livestock grazing/trailing.
Snowline Isolated 20719 (C) Acres: 359	Yes	N/A	N/A	Yes	Yes	Standards Achieved

Allotment Name, Number, Category and BLM Acres	Are Healthy Rangeland Standards Being Met?					Contributing factors in failing to meet Standards and summary of resource concerns.
	Upland	Riparian Wetland	[1]Water Quality	Air Quality	Bio-diversity	
Straight Creek Non-AMP 10697 (C) Acres: 1,083	Yes	N/A	N/A	Yes	Yes	Standards Achieved
Truax Creek 20642 (C) Acres: 379	Yes	Yes	Yes	Yes	Yes	Standards Achieved
Williams 20195 (I) Acres: 1,619	Yes	Yes	Yes	Yes	Yes	Standards Achieved

[1] To determine whether the water quality standard is being met in each allotment, the BLM identified which water bodies within the assessment area have been assessed by the DEQ then determined whether BLM managed land is contributing to impairment based on BLM Proper Functioning Condition assessment of riparian areas. For allotments that contain waterbodies that have not been assessed by the DEQ, please see Appendix E for the process in which Standard determination was made. The BLM and the State of Montana have detailed how they will cooperate in the assessment and planning process through a formalized Memorandum of Understanding.

The Authorized Officer determined that current livestock grazing impacts are contributing to one or more of the Standards not being met in the Snowline AMP allotment. Pursuant to 43 CFR 4180.2(c), livestock-caused failure to meet any of the Standards mandates the BLM to change the terms and conditions of the grazing permit/lease for the applicable grazing allotment prior to the next grazing season and implement actions that will result in significant progress toward fulfillment of the Standards. Further, BLM guidance stipulates that if other actions are necessary and cannot be implemented before the next grazing season interim adjustments will be made prior to the next grazing season and a schedule for final changes must be developed and documented (H-4180-1).

Decision to be Made

The BLM is preparing this EA to allow the Authorized Officer to make a reasoned and informed decision regarding improving riparian health, maintaining/enhancing upland health including sagebrush steppe habitat, improving forest and woodland health, enhancing biodiversity, adjusting motorized route designations, and revising or renewing term grazing permits. Revised grazing permits would contain appropriate terms and conditions to initiate significant and measureable progress towards achieving the Standards and Established Goals and Objectives within the RRLW.

The Dillon Field Manager will choose the Alternative that best addresses resource issues and concerns identified by the BLM and through scoping, and allows for multiple use.

The Dillon Field Manager must also determine if a selected alternative is a major Federal Action that significantly affects the quality of the human environment. If it is determined that it is, then an EIS must be prepared before the RRLW management plan can proceed.

Implementation of the Decisions issued as a result of this EA will begin in 2019, but full implementation may take several years and is subject to budget constraints. The decisions will be

implemented in consultation and coordination with the affected permittee/lessee(s), the agencies having lands or managing resources within the area, and other interested parties. As with all similar BLM decisions, affected parties will have an opportunity to protest and/or appeal these decisions.

Conformance with Land Use Plan

This document is tiered to the 2006 Dillon RMP as amended by the BLM's Idaho and Southwestern Montana Greater Sage-Grouse Approved RMP Amendment (ARMPA) approved in 2015. The management alternatives considered are in conformance with both the RMP and the ARMPA. Applicable guidance is in the Record of Decision (ROD) and Approved Dillon RMP, which may be accessed on the internet at ePlanning. The Idaho and Southwestern Montana Greater Sage-Grouse ARMPA and ROD can be also accessed on the Internet at ePlanning.
The 2006 Dillon RMP as amended identifies goals, objectives, and use allocation and management actions for each program area on the public lands managed by the BLM Dillon Field Office. All alternatives in this EA, except the No Action Alternative, propose treatments in support of these identified actions, allocations, and objectives.

Relationship to Statutes, Regulations, other Plans, or other NEPA Documents

The proposed actions are in conformance with the following laws, statutes, regulations, other plans, and NEPA:

- Laws and Statutes
    - Taylor Grazing Act of 1934 as Amended
    - Sikes Act of 1960, as amended (Habitat improvement on Public Land)
    - National Historic Preservation Act of 1966, as amended
    - Carlson-Foley Act of 1968 (Weed Control on Public Land)
    - National Environmental Policy Act of 1969 (NEPA)
    - Endangered Species Act of 1973
    - Migratory Bird Treaty Act of 1918
    - Federal Noxious Weed Act of 1974, as amended in 1988, 1994
    - Federal Land Policy and Management Act of 1976 (FLPMA)
    - Fishery Conservation and Management Act of 1976
    - Clean Water Act of 1977
    - Public Rangelands Improvement Act of 1978
    - State of Montana Streamside Management Zone Law of July 1991
    - National Fire Plan of 2000
    - Healthy Forest Initiative of 2002
    - Healthy Forests Restoration Act of 2003
    - Paleontological Resources Preservation Act of 2009
    - Wilderness Act of 1964
- Regulations and Manuals
    - Title 43 Code of Federal Regulation, Part 4100
    - Management of Wilderness Study Areas (manual 6330), 2012
    - Travel and Transportation Management Manual, MS-1626, 2016

    - Conducting Wilderness Characteristics Inventory, Manual 6310, 2012
    - Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process, Manual 6320, 2012
- Other Plans and NEPA
    - Standards for Rangeland Health and Guidelines for Grazing Management EIS of 1997
    - Dillon Resource Management Plan of 2006
    - Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic EIS- September 2007
    - Noxious Weed Control on Public Lands EA (MT-050-08-12)- April 2008
    - Idaho and Southwestern Montana Greater Sage-Grouse Approved RMP Amendment, September 2015
    - Sage grouse Habitat Assessment Framework- 2015
    - Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on BLM land in 17 Western States Programatic EIS-August 2016
    - Dillon Field Office Integrated Weed Management EA (DOI-BLM-MT-B050-2017-0018-EA) May 2017
    - 2007 Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout and Yellowstone Cutthroat Trout in Montana
    - 2010 Nonpoint source Memorandum of Understanding
    - Pheromone Use in the Dillon Field Office EA #DOI-BLM-B050-2011-007-EA

Public Involvement

The Council on Environmental Quality (CEQ) regulations require that agencies "make diligent efforts to involve the public in preparing and implementing their NEPA procedures" (40 CFR 1506(a)). Scoping is a form of public involvement in the NEPA process. External (or public) scoping is optional for EA's (40 CFR 1501.7). However, the BLM has found public scoping to be very beneficial. External scoping involves notification and opportunities for feedback from other agencies, organizations, tribes, local governments, and the public. External scoping is used to identify coordination needs, refines issues through public, tribal, and agency feedback on preliminary issues; gather additional information, identify new issues and develop additional alternatives. Public scoping serves to build agency credibility and promote constructive dialogue and relations with tribes, agencies, local governments, and the public.

External scoping for the RRLW was done by announcing the initiation of the watershed assessment process in May 2017, via a media release and letters to a comprehensive mailing list inviting input and participation. Additionally scoping was conducted by announcing the completion of the Watershed Assessment Report in December, 2017 through a media release and mailing it to all interested parties with a cover letter asking for comments. The Watershed Assessment Report was also posted on ePlanning. Many meetings were held by various IDT members with other agencies, public land users, land owners in the watershed and other interested parties to gather information and develop management alternatives.

In addition, according to 43 CFR subparts 4110, 4120, 4130, and 4160, coordination requirements identified in the Range Regulations include affected permittees or lessees, the interested public, the state having lands or responsible for managing resources within the area, other Federal or State resource management agencies, and the Resource Advisory Council.

"Interested Public" in the context of the Range Regulations means and individual, group, or organization that has submitted a written request to the Authorized Officer to be provided an opportunity to be involved in the decision making process for the management of livestock on a specific grazing allotments, or has submitted written comment to the Authorized Officer regarding the management of livestock grazing on a specific allotment.

Following the RRLW Assessment Report, the BLM met with federal agencies, state agencies, permittee's/lessee's and the interested public while developing this EA. A full list of agencies and individuals consulted is included in Chapter 5.

Resource Issues Identified for Analysis

Issues and resource concerns were identified during the RRLW assessment and the public scoping process. Issues, as described below, have a direct bearing upon the proposed action and the process of how the purpose and need will be achieved. The development of management alternatives are in direct response to the identified issues. Resource concerns do not necessarily drive the development of alternatives, but may be affected by the actions proposed in the various alternatives.

A range of management alternatives to address the resource issues and concerns are described in Chapter 2. The predicted effects on the environment of the various alternatives, and their relative effectiveness in meeting objectives, are analyzed in Chapter 4.

Three primary land health issues and several additional resource concerns are identified below. A brief description and explanation of the issues and concerns, as well as the management objectives for each issues and resource concerns are defined.

Progress toward meeting some objectives can be quantifiably measured, others, like reducing stream bank impacts and sediment input into streams, are evaluated over time by long term trend indicators such as relative changes in riparian vegetation composition and abundance and/or channel width/depth ratio.

Additional information about methodologies and documented resource concerns can be found in the RRLW Assessment Report, which is available at the Dillon Field Office or on the internet at ePlanning. The RRLW Assessment Report is incorporated into this EA by reference.

Not all issues or resource concerns identified below are applicable to all allotments in this EA. Site specific issues and concerns are discussed in Chapter 3 and the Red Rock/Lima Watershed Assessment Report. Objectives were developed for factors that were found to be limiting to land health (riparian, upland, forest) in specific areas or allotments within the watershed. Fish, wildlife and special status species habitat needs that may be affected by the alternatives are included as Resource Concerns. Resource concerns include special status species habitat and big game habitat, socioeconomics, noxious and invasive species, travel management, visual resource management, wilderness study areas, and cultural and paleontological resources.

Resource Issue #1: Riparian, Wetland and Aquatic Habitat

Standard #2 of the Western Montana Standards for Rangeland Health is "Riparian and Wetland Areas are in Proper Functioning Condition (PFC)." PFC is defined as the ability of a stream or wetland to perform its riparian functions based on its geomorphic potential. These functions

include sediment retention and transport; development of stabilizing root masses; water storage and aquifer recharge; and dissipation of stream energy during high flows. Streams or wetlands that are categorized as Functioning-At-Risk (FAR) with an upward trend also meet the riparian health standard as conditions are improving towards PFC. Within the RRLW 84% of the stream reaches and 90% of the wetland areas were rated PFC or FAR with an upward trend. Where streams were not PFC, some of the concerns included: alteration of stream morphology, reduced access to floodplains, down cutting, reduction in species diversity and composition, reduced vegetative cover, limited vegetative species recruitment and regeneration, reduced structural diversity, and/or decreased vigor of streamside vegetation. Generally, ungulate grazing and browsing, roads and road crossings, and juniper encroachment were the most frequently observed causal factors. The methods and procedures used to determine riparian health in the RRLW are discussed in the RRLW Assessment Report.

Objectives:

- Increase composition and cover of deep-rooted riparian species along stream channels and spring/wetland areas (reduce bare ground).
- Increase vigor and regeneration of aspen and other riparian deciduous tree and shrub species.
- Restore, maintain and/or improve physical condition of stream channel/streambanks (i.e. channel dimensions and streambed composition within expected range given channel type and position of landscape).
- Stop head cuts and restore vertical channel stability.
- Restore, maintain and/or improve floodplain connection by reducing channel entrenchment.
- Reduce sediment inputs into streams generated by human activities.
- Restore, maintain and/or enhance native vegetation and hydrology of springs, seeps and wet meadows with emphasis on ecological function and biodiversity.

Resource Issue #2: Upland -Sagebrush and Grassland Habitat

"Uplands are in PFC" is identified as Standard #1 of the Western Montana Standards for Rangeland Health. The determination of upland health was based on the evaluation of three criteria: soil and site stability, hydrologic function, and biotic integrity. The indicators used to determine upland health are discussed In the RRLW Assessment Report.

The uplands in all grazing allotments in the RRLW were found to be functioning properly under existing management. Sagebrush habitat in the RRLW is in good condition, however some areas have high (>25%) canopy cover of sagebrush. Conifer expansion into sagebrush steppe habitat is occurring at various extents on many of the allotments in the RRLW. Additionally, species diversity was lacking on specific ecological sites in several allotments. Each of these departures does affect upland health and ecological processes in various ways.

Objectives:

- Maintain high quality sagebrush and grassland habitat where it is present

- Improve the soil/site stability, hydrologic function, and biotic integrity of upland sites in allotments where one or more of these attributes of rangeland health was determined to be reduced.
- Increase cover and frequency, and diversity of native perennial cool season herbaceous species (especially bluebunch wheatgrass, and Idaho fescue which are priority upland plants) where concerns were documented, which will improve the soil and site stability, hydrologic function, and site productivity.
- Reduce phase 1 or phase 2 conifer encroachment within GRSG seasonal habitats through prioritization of vegetation treatments closest to occupied leks, while maintaining 15% sagebrush canopy cover on no less than 70% of existing sagebrush habitat throughout the watershed.
- Return fire to the landscape as a natural disturbance agent for the purpose of resiliency and diversity of seral classes (age, structure), through the use of prescribed fire.

Resource Issue #3: Forest and Woodland Habitat

Forests and woodlands are a vital and sizable component of the RRLW. Forest health during the assessment was of specific concern in two areas: Clark Canyon and the East Fork of Little Sheep Creek. In these locations it was noted that the extent and vigor of aspen is decreasing. Mountain mahogany is heavily browsed in the watershed, likely leading to the decadence observed in the Bell Canyon area. Rocky mountain juniper (juniper) and Douglas fir expansion are also shading and outcompeting mountain mahogany. Relative to historic stand structure, conifer densities have increased within stands. Conifer species, especially Douglas-fir, are experiencing mortality from insects and diseases, and are affected most notably by the western spruce budworm. Whitebark pine trees are declining throughout their range, and are of high priority with the petition to list them as a threatened or endangered species.

Objectives

- Maintain/enhance existing aspen and promote successful regeneration of aspen
- Where terrain and access allow, salvage dead and dying forest stands affected by insect activity, and promote future stand resiliency to insect epidemics. Utilize the resulting forest products where feasible.
- Mitigate mortality of whitebark and limber pine from insects and diseases in priority areas, and promote successful regeneration.
- Where possible, promote stand diversity by creating a mosaic of varied seral stages and stand structures using commercial and/or non-commercial timber harvest techniques.
- Consider planting mountain mahogany, removing competing juniper and Douglas fir expansion, and creating browse barriers to retain and enhance mountain mahogany habitat.

RESOURCE CONCERNS

Resource Concern #1: Special Status Species and Big Game Habitat

Special Status Species (SSS) include federally listed Threatened, Endangered, Proposed and Candidate Species, and BLM Sensitive Species. See the Biological Evaluation (BE) on

Threatened and Endangered (T&E) species, Special Status plants, wildlife and fish in appendix C and D for additional information. Special Status Species are discussed in the RRLW Assessment Report, as well as chapters 3 and 4 of this EA. Objectives for Riparian Health, Upland Health and Forest and Woodland Health are also included as objectives to fish, wildlife, and special status species habitat.

Objectives:

- Within Sage Grouse Priority Habitat Management Areas (PHMA), the desired condition is to maintain no less than 70% of all lands ecologically capable of producing sagebrush with a minimum of 15% sagebrush canopy cover or as consistent with specific ecological site conditions.
- Cooperate with MT Fish, Wildlife and Parks to expand the current distribution of westslope cutthroat trout (WCT)
- Maintain or enhance habitat for sensitive plant species and provide ample opportunity for reproduction and seedling establishment.
- Enhance/improve/protect "Priority Habitats" including aspen, mountain mahogany, whitebark pine and limber pine.

Resource Concern #2: Socioeconomics

Many ranches that hold BLM grazing permits/leases have developed operations dependent on a combination of public land grazing preferences and private land resources.

Utilization of timber resources from public lands has historically resulted in an economic benefit to southwest Montana. The potential for utilization of commercial forest products still exists.

Outdoor recreational opportunities such as hunting, hiking, and fishing on public lands provide an important economic contribution to the local economies. Outdoor recreation is one of the primary driving forces of the economy of southwest Montana.

Objectives:

- Continue to contribute to the local economy by providing an opportunity of sustained uses on public land including livestock grazing, forest and woodland products, and outdoor recreation.
- Recover economic value of dead/dying timber before it is lost to decay, where feasible.

Resource Concern #3: Noxious and Invasive Species

Spotted knapweed, houndstongue, Canada thistles, leafy spurge, dyers woad, black henbane, common mullein, and cheatgrass occur in relatively small patches or scattered individual plants in various locations within the assessment area. These noxious and invasive plants can affect upland health, riparian health, and biodiversity. Noxious and invasive species are discussed in the RRLW Assessment Report, as well as chapters 3 and 4 of this EA.

Objectives:

- Reduce or eliminate noxious and invasive vegetative species within the watershed.

- Mitigate the spread of noxious and invasive plants into, within or from the watershed.
- Prevent or minimize the spread of cheatgrass.

Resource Concern #4: Travel Management

The goals for both Travel Management and OHV Use and Transportation in the 2006 Dillon RMP as amended for Recreation collectively say "to manage roads and trails and manage motorized travel to provide for public access or administrative needs, while maintaining or protecting resource values in conjunction with other federal agencies, state and local governments, and private landowners."

Objectives:

- Effectively implement the Dillon RMP Travel Management Plan.
- Revise motorized route designations as necessary to correct mapping errors and improve route designations.
- Reduce unauthorized (non-designated route travel) motorized vehicle use.
- Maintain motorized wheeled vehicle access to those areas where it already exists, and improve access to public land where appropriate and where opportunities are currently limited.

Resource Concern #5: Visual Resource Management

The 6,676 acres within the Bell-Limekiln Canyon Wilderness Study Area on the west end of RRLW, is be managed as Class I. Preservation of the landscape is the primary management goal in Class I areas. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

A small portion of the watershed, 2,922 acres, located east of the Blacktail Mountains WSA is classified as VRM Class II. The objective of this class is to retain existing character of the landscape. Activities or modifications of the environment should not be evident or attract the attention of the casual observer. Changes should repeat the basic elements of form, line, color and texture found in the predominant natural features of the characteristic landscape.

The remainder of the watershed is classified as VRM Class III. VRM Class III objectives require partial retention of the existing character of the landscape and allow for moderate changes to the existing landscape. Management activities may attract attention, but should not dominate the view of the casual observer. Changes may be evident but may not detract from the existing landscape.

The visual resource contrast rating system wouls be used during project level planning to determine whether or not proposed activities would meet VRM objectives. Projects would identify mitigation measures to reduce visual contrasts and prepare rehabilitation plans to address landscape modifications on a case-by-case basis.

Objectives:

- Limit management activities or projects within the Bell-Limekiln Canyon Wilderness Study Area to avoid "attracting attention" in accordance with VRM Class I objectives.
- Manage the 2,922 acres, located west of the Blacktail Mountains WSA, as described in the VRM Class II guidelines; to retain the existing character of the landscape.
- Manage the remainder of the watershed according to objectives stipulated under VRM Class III guidelines.

Resource Concern #6: Wilderness Study Areas

There is no designated wilderness areas within the watershed boundary. However, the majority (6,676 of the 9,650 acres) of the Bell-Limekiln Canyon Wilderness Study Area (WSA) is within the watershed boundary. This WSA is managed in accordance with BLM Manual 6330, entitled Management of BLM Wilderness Study Areas. Management according to this policy is intended to ensure that wilderness values within these areas are not impaired until such time as congress either designates them as part of the National Wilderness Preservation System, or releases the area from further consideration as wilderness. If this WSA is released by Congress the area would be managed to emphasize multiple uses. The VRM management class would be modified to Class II objectives rather than Class I.

The planning area was inventoried for lands with wilderness characteristics in accordance with BLM Manual 6310 – Conducting Wilderness Characteristics Inventory on BLM Lands, published in March, 2012. The purpose of an inventory is to determine the presence or absence of wilderness characteristics. The BLM must document existing conditions as opposed to potential future conditions. The inventory evaluates wilderness characteristics as defined in Section 2(c) of the Wilderness Act and incorporated in FLPMA. In order for an area to qualify as lands with wilderness characteristics, it must possess sufficient size, naturalness, and outstanding opportunities for either solitude or primitive and unconfined recreation. In addition, it may also possess supplemental values.

A small portion, 1,872 acres, of the Maurer Mountain LWC unit (MT-050-004N) is within the watershed boundary. This unit was originally inventoried in 1974 as a portion of the Big Spring Gulch (MT-076-004) unit. The area possess sufficient size, appears natural, and possess outstanding opportunities' for solitude and unconfined primitive recreation. The unit was most recently inventoried in 2011. This unit is long, narrow, north-south trending mountain range consisting of low sagebrush and grass communities, with multiple east-west trending drainages which dissect the unit. Major human uses include livestock grazing, and big game and upland bird hunting. The high ridgeline offers outstanding scenic views of the surrounding area. The multiple drainages that dissect the unit would offer outstanding opportunities' for solitude. The unit provides good hunting opportunities for big game and upland birds, although these opportunities are not outstanding on a regional scale.

Objectives:

- Maintain wilderness characteristics of the Bell-Limekiln Canyon WSA.
- Manage the Bell-Limekiln Canyon WSA to the non-impairment standard as outlined in BLM Manual 6330 - Management of Wilderness Study Areas, until congress either releases it from further consideration or designates it as wilderness.
- Maintain, on a continuing basis, an inventory of wilderness characteristics as describe in BLM Instruction Memorandum No. 2011-154.

Resource Concern #7: Cultural and Paleontological Resources

A variety of different cultural resources, including pre-contact and historic sites are in the RRLW. No paleontological resources have been identified in the RRLW; however, some areas do have high to very high potential for fossils. A summary is provided in Chapter 3 and more detailed information concerning the cultural and paleontological resources occurring on each allotment in the RRLW is on file in the Dillon Field Office. The Dillon RMP provides the following objectives for managing cultural and paleontological resources:

Objectives:

- Preserve and protect significant cultural and paleontological resources and ensure that they are available for appropriate uses by present and future generations.
- Reduce imminent threats from natural or human-caused deterioration, or potential conflict with other resource uses.
- Ensure that all authorizations for land and resource use avoid inadvertent damage to federal and non-federal cultural and paleontological resources in compliance with Section 106 of the National Historic Preservation Act and Paleontological Resources Protection Act. Consult with Native Americans to identify cultural values or religious beliefs that may be affected by BLM authorizations or actions.

Issues/Resources Considered but Eliminated from Further Analysis

Water Quality

In 2012, DEQ completed its Beaverhead TMDLs and Framework for Water Quality Restoration Plan and is in the process of assessing the Red Rock TMDL planning area. So far the DEQ has assessed one waterbody within the assessment area, Clark Canyon Creek, which failed to meet one or more water quality standards. In accordance with the Water Quality Memorandum of Understanding between the BLM and the DEQ (USDI, 2010), it is the BLM's responsibility to determine if BLM administered lands are contributing to impairment of any listed stream. The BLM uses its land health assessment results to identify indicators of nonpoint source pollution and in combination with DEQs assessment results the BLM determines whether the water quality standard is being met on an allotment basis (see flow chart included in Appendix E).

As can be ascertained by Table 1.1 above, there is a strong correlation between the Riparian/Wetland Standard Determination and the Water Quality Standard Determination (Appendix E). Since water quality and the land health assessment results are interconnected, water quality concerns will be addressed by the other identified issues that will drive alternatives to improve land health. Therefore, Water Quality and TMDLs have been considered and eliminated from further consideration as key issues in this document.

Wildlife

Wildlife species and their habitats in the RRLW were considered during the assessment. Since not all wildlife and their associated habitat had concerns, not all were included in this EA as an issue or resource concern, and are not analyzed if they are not affected. Several wildlife species,

including a variety of birds, utilize the same habitats that are included as issues. While not every species is mentioned in the impact analysis, the effect to those species is similar to that of species that are included and analyzed (i.e. impact on foraging, cover, nesting, etc.). Particular habitat requirements and levels of dependence on these habitats vary by species and in general, the group is often represented by an "umbrella" or "focal" species whose habitat needs represent the needs of other species (i.e. sagebrush obligate species represented by sage grouse since they use a diversity of habitat).

Recreation

Dispersed recreational activities would continue to be managed consistent with other resource management objectives. Special Recreation Permits would continue to be considered on a case-by-case basis with the exception of big game hunting. Outfitted big game hunting would continue to be limited to existing permits and historical use levels. Opportunities for big game hunting, wildlife viewing, horseback riding, and other backcountry recreation would be maintained. Recreation was considered during the assessment but it was determined that there were no impacts to analyze therefore recreation has been considered but eliminated from further consideration as a key issue in this document.

Special Status Fish

There are currently no known populations of special status fish on BLM lands within the RRLW. In the future, if MT FWP moves forward to re-introduce special status fish into drainages within the boundaries of the RRLW, the BLM would fully support and cooperate with such actions as stated under objectives in Resource Concern #1: Special Status Species Habitat.

Chapter 2 Proposed Alternatives

Introduction

This chapter describes the alternative development process, alternatives considered but eliminated from further analysis, and alternatives carried forward and fully analyzed. As many as four alternatives will be fully analyzed: the No Action Alternative (continuation of current management) and up to three action alternatives. Alternatives may apply to individual allotments (e.g. grazing management changes), or across the broader landscape (e.g. noxious and invasive species mitigation). Based on individual issues, combinations of allowable use levels, grazing systems, stocking rates, vegetative treatments, and program specific projects were discussed at length and carefully considered during scoping and formulation of the management alternatives by the IDT.

Process Used to Formulate Alternatives

The development of management alternatives for the watershed was guided by provisions of FLMPA and NEPA, as well as planning criteria defined in Chapter 1 (key issues, resource concerns, objectives), and public input received during scoping. Other laws, as well as BLM planning regulations and policy, also directed alternative considerations and focused the alternatives on appropriate watershed-level decisions. Chapter 1 discusses the key issues and resource concerns used during the alternative development. The Affected Environment (Chapter 3) describes the resources conditions related to the issues and resource concerns identified in Chapter 1.

Alternatives Considered but Eliminated

Alternatives that would not make significant progress toward meeting the objectives of the proposed action, or are not consistent with the intent of current BLM legal and regulatory requirements or policy, are not fully analyzed in this document. Alternatives that propose exclusive utilization, development or protection of one resource at the expense of other resources are not considered. FLPMA mandated the BLM to managed public lands for multiple use and sustained yield. This eliminated alternatives such as closing all public lands to livestock grazing, oil and gas leasing, or managing only for wildlife values at the exclusion of other considerations. In addition, resource concerns in the RRLW do not warrant watershed-wide prohibitions of any specific use. Each alternative considered in this EA allows for some level of support, protection, and/or use of all resources present in the planning area. The following alternatives were considered but eliminated for detailed study.

Alternatives Considered but Eliminated from Detailed Analysis

Elimination of livestock grazing on all allotments: Only one allotment, Snowline AMP, did not meet standards due to current livestock grazing. This represents approximately 13.5 % of the total BLM acres in the RRLW. However, only conditions within the Pine Butte Pasture of this allotment led to the substandard rating. The Pine Butte pasture contains 1,859 acres of public land (2.6% of the BLM managed public land in the RRLW). Eliminating livestock grazing on all

of the public lands in the RRLW because less than 3% of the public lands were not meeting standards for rangeland health due to current livestock grazing does not satisfy the purpose and need of this EA, the 2006 Dillon RMP as amended, or the Federal Land Policy Management Act (FLPMA). The loss of forage (11,348 AUM's) across the watershed would affect each of the 12 business entities to varying degrees, as BLM forage within the RRLW ranges from < 100 AUM's for five businesses up to over 2,000 AUM's for two businesses. In addition to the direct loss of forage; eliminating livestock grazing from these public lands would also result in increased operational expenses for some of these businesses in the form of increased feed, and potentially increased transportation costs. More importantly, to effectively eliminate livestock grazing on BLM managed public lands within the watershed, countless miles of boundary fence would have to be constructed, and maintained. These fences would have negative impacts on daily and seasonal movements of many wildlife species throughout the watershed. This amount of new fence would also be cost prohibitive. Eliminating livestock grazing from all allotments would be economically infeasible.

Elimination of livestock grazing from the Snowline AMP allotment: Elimination of livestock grazing from within snowline allotment was considered because of the failure to meet the riparian and water quality standard. However due to the land pattern within the allotment, approximately 30 miles of fence would need to be constructed to keep livestock off of the BLM managed public lands. At a low estimate of $8,000 per mile of fence constructed this would require a minimum of $240,000 to construct, without taking into consideration other costs such as legal survey, and maintenance, making this alternative economically infeasible. Additionally, of the nine pastures within the Snowline AMP allotment only one pasture, the Pine Butte pasture, did not meet all applicable Standard for Rangeland Health. In consideration of the above facts, eliminating livestock grazing across the allotment as a whole was eliminated from detailed analysis.

Sagebrush Control Treatments to restore natural Vegetative Functional/Structural groups: Vegetative functional/structural groups were found to be departed on multiple allotments throughout the RRLW. Commonly, sagebrush, a native increaser shrub was present with increased abundance, resulting in decreased herbaceous production. Many of these sites are located in either Sage Grouse Priority or General Habitat Management Areas. As such, Habitat Assessment Framework (HAF) data was collected on many of these allotments. While the increase of sagebrush has resulted in decreased herbaceous production in many areas, the HAF data shows that herbaceous communities continue to support the necessary components for suitable sage grouse habitat. The 2015 ARMPA MD Veg 2(pg. 2-17) states vegetation rehabilitation can occur where sagebrush canopy or herbaceous components do not meet habitat objectives. As herbaceous objectives are being met this alternative does not satisfy the 2015 ARMPA. Additionally, active sagebrush control is occurring in some areas of the watershed, on private property, highlighting the importance of existing sagebrush habitat on BLM managed public land. This alternative would not meet the purpose and need of this EA and therefore was eliminated from detailed analysis.

Commercial Timber Harvest on BLM-Administered Lands in East Fork of Little Sheep Creek: Commercial timber harvest units in East Fork of Little Sheep Creek were considered but eliminated from further analysis. Little Sheep Creek, with approximately 110 forested acres, contains relatively small diameter trees, is experiencing heavy defoliation on most of the stand, and mortality within the stand at about 15%. Additionally extensive road building and steep

slopes would make harvesting of this area difficult, rendering this alternative technically and economically infeasible.

Features Common to All Alternatives

Livestock Grazing

Term grazing authorizations on 20 allotments including 28,217 BLM administered acres that have been determined to be meeting all standards for rangeland health, or where standards were not met for reasons other than current livestock grazing would be re-issued with no changes to the mandatory terms and conditions, unless the operator has requested changes to the authorization. All authorizations would continue to include standard Dillon Field Office "Other Terms and Conditions", listed below. Additionally all allotment specific terms and conditions regarding specific resource issues or management would continue to be carried forward. These allotments are: Allotment E, Bell Canyon, Clark Canyon Isolated, Lima Peaks, Little Sheep, Lovell's Lake Non-AMP, North McKnight, Pinetop Hill, Phalarope West, Radio TV, Roe, Roe Isolated, Roe West, Seybold Individual, Seybold Non-AMP, Slanger, Snowline Custodial, Snowline Isolated, Straight Creek Non AMP, Truax. The authorization mandatory terms and conditions, specified management schemes and tentative rotations as well as specific "other terms and conditions" for each allotment are listed under Alternative A, Table 2.1.

The Ney Ranch un-allotted parcel would continue to be managed as an un-allotted parcel available for Temporary Non Renewable (TNR) grazing use, as discussed under Alternative A, Table 2.1.

All other un-allotted parcels would continue to be managed as un-allotted. On these parcels, no active grazing authorizations would be issued.

Standard Dillon Field Office Grazing Authorization "Other Terms and Conditions"

- The BLM encourages, and if warranted, will require the use of temporary electric fence, strategic placement of livestock supplement (e.g. Salt, protein block), riding, and herding as a means of improving livestock distribution.
- Annual utilization thresholds on cool season bunchgrasses will be 50% or less to maintain plant health/vigor and leave adequate residual cover for wildlife.
- Maintain an average sedge height of four inches or more along the riparian greenline of non-fisheries or non-native fisheries streams, and six inches on all weststlope cutthroat trout streams.
- With prior approval, flexibility will be authorized for the season of use on each allotment if annual weather conditions and forage production warrant. The season of use begin and end dates may be adjusted up to seven days due to yearly variations in weather affecting forage production.
- After consultation with the BLM, and written approval. The planned pasture grazing sequence (AMP) may be adjusted due to drought or other unforeseen natural events. Also, with prior approval, more livestock may be grazed for a shorter period of time within the authorized season of use. However the maximum authorized AUM's or season of use as specified in the authorization cannot be exceeded.
- Permittees or lessees shall provide reasonable administrative access across private and leased land to the BLM for the orderly management and protection of public lands.

Water Developments:

- All water developments and troughs no longer in use would be removed, but spring exclosure fences may be retained and maintained. Underground components to water developments (e.g.: pipelines) may be left in place to limit ground disturbance.
- All troughs would have functional wildlife escape ramps installed
- Annual maintenance would be completed, as agreed to in the Cooperative Agreements, to assure that water developments, including spring boxes, pipelines, troughs, valves, shutoff devices, and exclosures are functioning and in good condition.
- Design features to mitigate potential for West Nile Virus would be incorporated into water developments (USDI, 2015a, Appendix C) including:
    - Maintain a properly functioning overflow on troughs to prevent water from flowing onto the pad and providing for mosquito habitat.
    - Clean and drain stock tanks before and after the grazing season. Vegetation and soil free tanks are not conducive to mosquito reproduction.
    - Install and maintain float valves on stock tanks/troughs to minimize overflow which may provide mosquito habitat.
    - Modify developed springs, seeps, and associated pipelines to maintain predominant riparian areas within sage grouse habitat where necessary.
    - Harden stock tank pads to reduce tracks that can potentially hold water and provide mosquito habitat
    - Develop and Maintain non-point/reservoir livestock watering facilities, such as troughs, and bottomless tanks to provide livestock water.

Fences:

- Existing BLM fences that impede wildlife movement would be modified or rebuilt to BLM specifications on a prioritized schedule. Dysfunctional or unnecessary fences on public land would be removed, modified, and/or rebuilt.
- Fences and exclosures that are determined to be in a high use area for sage grouse (i.e. fences within ¼ mile of a lek and/or winter concentration areas; considering topography, vegetation, visibility, etc.) would be marked with flight diverters to reduce collisions (USDA, 2012 and USDI, 2015).

Non-Commercial Mechanical/Prescribed Fire Treatments:

Non-commercial mechanical/prescribed fire treatments were analyzed in the 2007 Red Rock/Lima Watershed EA (DOI-BLM-MT-B050-2007-0069). Many of those treatments have been completed, while a few treatments have not yet been implemented. All applicable design features discussed under Actions Common to All Alternatives would be incorporated into the implementation of these treatments. The rationale for implementing non-commercial mechanical/prescribed fire treatments analyzed in Alternative C of the 2007 RRLW EA remains unchanged. Continuing the implementation of the previously analyzed non-commercial mechanical/prescribed fire treatments would continue to make progress towards meeting Goal 1, Actions 4 and 5, and 8, of the Rangeland Vegetation section of the Dillon Resource Management Plan 2006, as well as Objective 3, Management Decision VEG 1 of the Dillon ARMPA 2015.

Fire Management

Wildland fire management within the RRLW would be implemented in accordance with the 2006 Dillon RMP as amended. The RRLW is classified under fire management Category C within the RMP. Category C identifies "areas where fire is desired to manage ecosystems, but there are significant constraints that must be considered for its use." Those constraints may include: loss of livestock forage, wildlife seasonal habitat and migration corridors, sensitive species habitat, and the fragmentation of sagebrush habitat from private land uses.

Forest and Woodland Treatments:

Personal use firewood permits and Christmas tree permits would continue to be issued. The following would also continue for 5-Needle Pine Treatments:

- Cones would be collected on whitebark and/or limber pine trees suspected to be resistant to white pine blister rust and would be sent for testing to determine their resistance level and/or stored for future planting.
- Pheromones (e.g. verbenone) would be applied to selected trees to protect them from attack by mountain pine beetle. (Refer to Pheromone Use in the Dillon Field Office EA #DOI-BLM-B050-2011-007-EA).
- Additional cones would be collected as funding and cone crops allow. This seed may be sent to the national seed bank and genetic restoration program and/or incorporated into an office-wide operational collection that has been banked for future management efforts.

Riparian Vegetation Treatments:

Treatments to improve riparian vegetation were analyzed in the 2007 Red Rock/Lima Watershed EA (DOI-BLM-MT-B050-2007-069) and the 2007 Beaverhead West Watershed EA (DOI-BLM-MT-B050-2007-70) and treatments identified in Alternative C were completed in 2010. Of the riparian juniper removal completed, many reaches have juniper that were missed during the initial cutting treatment. In most cases the survivors were small and not detected during the time of implementation. Maintenance to remove the remaining small juniper would require much less effort as the remaining juniper density is low. The rationale for completing these riparian treatments has not changed as analyzed in the 2007 EA and maintenance will be a continuation of the previously analyzed action.

Travel Management:

Travel management would be implemented as prescribed in the 2006 Dillon RMP as amended. Roads identified as open to public use would be signed with a white arrow symbol on a flexible sign post. Roads not identified as open to public use would be:

- Left unsigned unless there is evidence of regular use.
- Signed closed if there is evidence of regular use.
- If signing is ineffective at discouraging use, roads would be obliterated to the extent possible (made unnoticeable), at least at the intersection with an open route, or physically closed when continued use is causing unacceptable resource impacts or user conflicts.

Noxious and Invasive Species:

- Management of noxious weeds would continue in cooperation with Beaverhead County, federal and state agencies, private landowners and other partners.

- All invasive species on the Montana state noxious weed list would be treated as resources allow.
- Areas where adjacent landowner support and cooperation is the highest would be given the highest priority for treatment.

Special Status Species:

Activities that disturb mineral soil (such as blading, plowing, ripping, etc.) may not be allowed within the boundaries of populations of special status plant species. In habitats likely to support rare plants, field inspections would be conducted to search for special status plant species prior to authorizing surface disturbing activities. If rare plants are found in the course of the botanical survey, adverse impacts would be mitigated through project redesign or abandonment.

The BLM, in cooperation with other agencies and partners, would continue to monitor sage grouse leks. Within Sage Grouse Priority Habitat Management Areas, the desired condition is to maintain all lands ecologically capable of producing sagebrush (but no less than 70%) with a minimum of 15% sagebrush canopy cover or as consistent with specific ecological site conditions (ARMPA, page 2-16). Seasonal habitat objectives from the ARMPA would be incorporated within that 70% of sagebrush habitat to maintain existing habitat so that 80% or more of big sagebrush communities provide vegetative composition and structure for sage grouse nesting/early brood rearing, >40% sagebrush habitat meets summer/late brood habitat characteristics, and >80% meets winter habitat characteristics where appropriate (relative to ecological site, etc.) (USDI, 2015a). As stated in the ARMPA (page 2-4): "*While the habitat objectives are not attainable on every site or every acre within designated GRSG habitat management areas, the values reflect a range of habitat conditions that generally lead to greater survival of individuals within a population. BLM should consider the ecological site potential within designated habitat management areas to validate the habitat conditions achievable for a specific site. These measurable values reflect ecological potential, and may be adjusted based on local factors influencing sage-grouse habitat selection. Local data or recent science may indicate that sage-grouse select for vegetation structure and composition in seasonal habitats not characterized by the values in the habitat objectives table. In these cases, it may be appropriate to adjust the values. Habitat objectives should be evaluated in the context of annual variability in ecological conditions and should not be used singly to determine habitat suitability for sage-grouse. They may be used to demonstrate trends over time, during plan evaluations for effectiveness of sage-grouse conservation, or when identifying limiting habitat characteristics for a given area.*"

West Nile Virus (WNV) has been linked to sage grouse mortality in multiple areas. WNV has not been documented on BLM lands within the Dillon Field Office, nor in sage grouse in Beaverhead County. Appendix C in the ARMP provides guidance for WNV. Management to reduce impacts of WNV focuses on eliminating man-made water sources that support breeding mosquitoes known to vector the virus. Whether the water development is for livestock water, wildlife habitat, fish, or storm water management, potential habitat for mosquitoes may be increased. Incorporating applicable design and mitigation measures in water development projects can reduce mosquito production through modifying and eliminating mosquito breeding sites.

Term grazing permits shall be amended to state that depredation losses from wolves and grizzly bear are possible. A stipulation would also be added to grazing permits stating that the

permittee, agency personnel, and Montana FWP will jointly determine how to properly treat or dispose of livestock carcasses on BLM administered land to reduce the potential for attracting predators. Although there have not been any confirmed grizzly bear sightings or conflicts reported in RRLW, permittees must notify the BLM, MT FWP, or Wildlife Services as soon as is practical of any grizzly bear depredation on livestock or conflicts between grizzly bears and livestock, even if the conflict does not result in the loss of livestock. This notification would likely reduce the potential for livestock depredation and removal of the grizzly bear. Food storage recommendations would also be encouraged to reduce potential conflicts between grizzly bear and public land users. These food storage recommendations may become a required order in the future.

Wilderness Study Areas:

The Bell-Limekiln Canyon Wilderness Study Area would continue to be managed in accordance with BLM Manual 6330, "Management of BLM Wilderness Study Areas" until such time as Congress either designates the area as wilderness or releases it from further consideration. Management in accordance with the current policy requires that the wilderness conditions that existed at the time of the original inventory be unimpaired until such time as Congress can make that determination, no matter how long that may take. Should Congress release the area from further consideration, it would be managed in accordance with Appendix Q of the 2006 Dillon RMP, as amended, to emphasize semi-primitive non-motorized recreation opportunities and it would be managed as VRM Class II.

The BLM would continue to monitor Lands with Wilderness Characteristics and would analyze any impacts from any proposed projects on those Wilderness Characteristics.

Cultural and Paleontological Resources:

A Class III Inventory would be completed prior to the implementation of any proposed range or habitat improvement project in accordance with BLM 8110 Manual Guidance and as required by Section 106 of the National Historic Preservation Act. Cultural resources determined eligible to the National Register of Historic Places, unevaluated cultural resources, and sites that are identified as traditional cultural properties or sacred places would be protected and avoided through project redesign or abandonment. The Henneberry House and cabin (24BE2099), within the Ney Ranch un-allotted parcel, would be preserved, rehabilitated, and/or restored in accordance with the Secretary of Interior's Standards for the Treatment of Historic Properties.

If necessary, a paleontological inventory for proposed projects in the Bell Canyon, Gallagher Mountain, and Radio TV allotments would be completed prior to project implementation in accordance with the Paleontological Resources Preservation Act. These allotments have high to very high potential (PFYC 4-5) for paleontological fossils. If paleontological sites are identified, impacts would be mitigated through project abandonment or redesign. Permittees and contractors doing work on public lands should notify the BLM if they encounter cultural and/or paleontological resources.

Annual monitoring of cultural resources that are eligible to the National Register of Historic Places and/or that have been identified as places of tribal traditional, cultural, and religious value would be completed in order preserve and protect these resources. Monitoring would be done according to the monitoring plan shown in Appendix B.

Alternative A (No Action)

No Action is defined as “no change” or the continuation of current management. This alternative will be analyzed to serve as baseline information for the Authorized Officer to make a reasoned and informed decision.

Livestock Grazing:

Under Alternative A, livestock grazing management would continue under the current Terms and Conditions in all 28 grazing allotments as shown in Table 2.1. No new range improvements would be constructed under Alternative A. Please note, Table 2.1 lists the current management on the 20 allotments where: All standards were met. Standards were not met, but current livestock grazing was not the causal factor for not meeting the standard. The BLM or the operator has not initiated a change the current management. Grazing management on these allotments will not be discussed in the “Action” Alternatives B-D.

TABLE 2.1: ALTERNATIVE A (CURRENT LIVESTOCK GRAZING)

Table 2.1 Alternative A (Current Livestock Grazing Management)

- **Allotment E 10149 (C)** **(There are no proposed management changes in other Alternatives)**

Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	6 Cattle	4/1-1/24	100	Active	59
Specified Grazing System	N/A				
Grazing Rotation/Terms	N/A				

- **Bell Canyon, 20193 (I)** **(There are no proposed management changes in other Alternatives)**

Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	175 Cattle	5/15-9/30	56	Active	448
Specified Grazing System	Rest Rotation/Annual Deferred Use				

Grazing Rotation/Terms

Year	North Flats Pasture	South Flats Pasture	Hills	Mountain
1	May 15-June 14	Rest	June 15-Aug. 15 (Up to 60 days)	Aug. 1- Sept. 30 (Approximately 45 Days)
2	Rest	May 15-June 14		

- **Cedar Creek 10124 (I)**

Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	176 Cattle	5/9-6/30	100	Active	307
Specified Grazing System	Rest Rotation				

Grazing Rotation/Terms

Year	Williams	Shoshone Cove	Cedar Creek
1	May 9-June 5	June 6-June 30	Rest
2	June 6-June 30	Rest	May 9-June 5
3	Rest	May 9-June 5	June 6-June 30

All three allotments (Cedar Creek, Shoshone Cove, Williams) will be grazed with up to 250 cow/calf under a three treatment (early spring, late spring, rest) grazing schedule for up to 53 days annually.

- **Clark Canyon 30002 (I)**

Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	400 Cattle	5/15-10/15	35	Active	654
			15	Active	281

Table 2.1 Alternative A (Current Livestock Grazing Management)

Specified Grazing System: Rest Rotation/Annual Deferred Use

Grazing Rotation/Terms:

Year	West McMenomy	Middle McMenomy	Dry Gulch	East McMenmoy	Horse Creek	State Buck
1	Graze	Graze	Graze	Rest	Rest	Rest
2	Rest	Rest	Rest	Graze	Graze	Rest
3	Rest	Graze	Graze	Rest	Rest	Graze
4	Graze	Rest	Rest	Rest	Graze	Graze
5	Rest	Graze	Rest	Graze	Rest	Graze
6	Graze	Rest	Graze	Rest	Rest	Graze
7	Rest	Rest	Rest	Graze	Graze	Rest
8	Rest	Graze	Graze	Rest	Rest	Graze
9	Graze	Rest	Rest	Rest	Graze	Rest
10	Rest	Rest	Rest	Rest	Graze	Rest

Graze = Grazing may occur in pasture from May 15– July 7, Rest = no grazing during the grazing year

Year	Horse Mountain	Clark Canyon #2	Clark Canyon #3	Clark Canyon #4	Clark Canyon #1
1	7/8- 7/30	7/31-8/29	8/30-9/14	9/15-10/1	10/2-10/15
2	10/2-10/15	9/15-10/1	8/30-9/14	7/31-8/29	7/8-7/30

- **Clark Canyon Isolated, 20206 (C))** **(There are no proposed management changes in other Alternatives)**

	# and Kind	Season of use	% PL	Type Use	AUM's
Mandatory Terms and Conditions	2 Cattle	5/15-12/31	100	Active	12
Specified Grazing System	N/A				
Grazing Rotation/Terms	N/A				

- **Gallagher, 20114 (M)**

	# and Kind	Season of use	% PL	Type Use	AUM's
Mandatory Terms and Conditions	140 Cattle	6/1-10/7	90	Active	534
Specified Grazing System	Rest Rotation/Annual Deferred Use				

Table 2.1 Alternative A (Current Livestock Grazing Management)

Grazing Rotation/Terms

Year	Lower Bill Hill	Upper Bill Hill	North Gallagher	South Gallagher	Gravel Pit	Beacon Hill	Meadow
1	Rest	8/10-9/10	7/6-8/9	6/1-7/5	9/11-9/17	9/18-9/30	10/1-10/7
2	6/1-7/5	Rest	8/10-9/10	7/6-8/9	9/11-9/17	9/18-9/30	10/1-10/7
3	7/8-8/14	6/1-7/7	Rest	8/15-9/14	Rest	9/15-9/27	9/28-10/4
4	8/10-9/10	7/6-8/9	6/1-7/5	Rest	9/11-9/17	9/18-9/30	10/1-10/7

- **Gallagher Mountain AMP, 30013 (I)**

Mandatory Terms and Conditions

# and Kind	Season of use	% PL	Type Use	AUM's
1200 Cattle	5/1-11/20	100	Active	3,231
15 Horse	12/1-5/15	45	Active	37

Specified Grazing System

Rest Rotation/Annual Deferred Use

Grazing Rotation/Terms

Year	Warm Springs	Dry Mast	Lovell	Gallagher	Henneberry	Clark Canyon
Plan	**2 Pasture Rest Rotation**		**3 Pasture Rest Rotation**			**Annual Use**
1	5/1-5/31	Rest	10/15-11/20	Rest	5/15-7/15	10/1-10/20
2	Rest	5/1-5/31	Rest	6/1-7/15	10/15-11/20	7/15-7/31
3	5/1-5/31	Rest	5/15-7/15	10/15-11/20	Rest	10/1-10/20

- **Lima Peaks, 30270 (M)** **(There are no proposed management changes in other Alternatives)**

Mandatory Terms and Conditions

# and Kind	Season of use	% PL	Type Use	AUM's
264 Cattle	7/11-10/15	28	Active	236

Specified Grazing System

Rest Rotation

Grazing Rotation/Terms

Year	East Creek	Dutch Hollow
1	7/11-8/21	8/22-10/15
2	Rest	7/16-9/18
3	8/22-10/15	7/11-8/21
4	7/16-9/18	Rest

- **Little Sheep 10622 (C)** **(There are no proposed management changes in other Alternatives)**

Mandatory Terms and Conditions

# and Kind	Season of use	% PL	Type Use	AUM's
1 Cattle	5/15-12/31	100	Active	8

Specified Grazing System

N/A

Grazing Rotation/Terms

N/A

Table 2.1 Alternative A (Current Livestock Grazing Management)

- **Lovell's Lake, 30605 (C)** **(There are no proposed management changes in other Alternatives)**

Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	4 Cattle	5/1-11/30	100	Active	28
Specified Grazing System	N/A				
Grazing Rotation/Terms	N/A				

- **Norris Canyon, 20109 (M)**

Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	450 Cattle	6/1-6/21	43	Active	72
		11/6-11/11	43	Active	38
Specified Grazing System	Deferred Rotation				

Grazing Rotation/Terms	**Year**	**Season**
	1	6/1-6/10
	2	6/11-6/21
	3	11/6-11/11

- **North McKnight, 20746 (I)** **(There are no proposed management changes in other Alternatives)**

Mandatory Terms and Conditions	**# and Kind/Location**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	137 Cattle- South Pasture	5/10-6/10	42	Active	61
		10/16-11/16	42	Active	61
	38 Cattle -North Pasture	7/11-12/10	62	Active	119
Specified Grazing System	N/A				
Grazing Rotation/Terms	N/A				

- **Phalarope West, 30204 (C)** **(There are no proposed management changes in other Alternatives)**

Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	40 C	10/1-4/30	100	Active	76
Specified Grazing System	N/A				
Grazing Rotation/Terms	N/A				

Table 2.1 Alternative A (Current Livestock Grazing Management)

- **Pinetop Hill, 03192 (C)** **(There are no proposed management changes in other Alternatives)**

	# and Kind	Season of use	% PL	Type Use	AUM's
Mandatory Terms and Conditions	2 Cattle	6/2-9/29	100	Custodial	7
Specified Grazing System	N/A				
Grazing Rotation/Terms	N/A				

- **Radio TV, 00150 (M)** **(There are no proposed management changes in other Alternatives)**

	# and Kind	Season of use	% PL	Type Use	AUM's
Mandatory Terms and Conditions	368 Cattle	10/1-11/30	56	Active	413
Specified Grazing System	N/A				
Grazing Rotation/Terms	N/A				

- **Roe, 20727 (M)** **(There are no proposed management changes in other Alternatives)**

	# and Kind	Season of use	% PL	Type Use	AUM's
Mandatory Terms and Conditions	232 Indigenous	7/1-10/15	43	Active	351
Specified Grazing System	Rest Rotation				

Grazing Rotation/Terms

Year	Treatment
1	Graze
2	Graze
3	Rest

- **Roe Isolated (C)** **(There are no proposed management changes in other Alternatives)**

	# and Kind	Season of use	% PL	Type Use	AUM's
Mandatory Terms and Conditions	2 Indigenous	5/15-2/28	100	C	12
Specified Grazing System	N/A				
Grazing Rotation/Terms	N/A				

- **Roe West, 20728 (M)** **(There are no proposed management changes in other Alternatives)**

	# and Kind	Season of use	% PL	Type Use	AUM's
Mandatory Terms and Conditions	1164 Yearling Cattle	4/10-5/10	100	Active	980

Table 2.1 Alternative A (Current Livestock Grazing Management)					
Specified Grazing System	Annual Dormant Season				
Grazing Rotation/Terms	Grazing use shall begin in east pasture for approximately 2 weeks.				
• **Seybold Individual, 20686 (C)** **(There are no proposed management changes in other Alternatives)**					
Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	1 Cattle	5/1-11/30	100	Active	7
Specified Grazing System	N/A				
Grazing Rotation/Terms	N/A				
• **Seybold Non-AMP, 20187 (C)** **(There are no proposed management changes in other Alternatives)**					
Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	1 Cattle	5/1-11/30	100	Custodial	6
Specified Grazing System	N/A				
Grazing Rotation/Terms	N/A				
• **Shoshone Cove, 20192 (M)**					
Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	195 Cattle	5/9-6/30	50	Active	170
Specified Grazing System	Rest Rotation (See Cedar Creek above)				
Grazing Rotation/Terms	N/A				
• **Slanger, 20712 (C)** **(There are no proposed management changes in other Alternatives)**					
Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	8 Cattle	6/1-8/30	100	Custodial	22
Specified Grazing System	N/A				
Grazing Rotation/Terms	N/A				

Table 2.1 Alternative A (Current Livestock Grazing Management)

- **Snowline AMP, 30029 (I)**

Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	1044 Cattle	6/6-10/21	42	Active	1989
Specified Grazing System	Rest Rotation				

Grazing Rotation/Terms

Number Livestock	**Pasture**	**Year 1**	**Year 2**	**Year 3**
650 Cattle	Field 6	6/17-7/30	9/10-10/20	Rest
	Field 8	9/11-10/20	6/17-9/9	7/22-10/20
	Field 9	8/1-9/10	Rest	6/17-7/21
700 Cattle	South Dutch Hollow	Rest	6/21-7/21	9/26-10/17
	North Dutch Hollow and Field A2 and A3	6/21-7/26	8/28-10/8	Rest
	Little Lease (private) and Field A4	7/27-8/17* not to exceed 10 days in A4	Rest	6/21-7/12
675 Cattle	Pine Butte	9/3-10/21	Rest	6/6-7/22

- Not to exceed 10 days in field 4 A
- Not to exceed 21 days in the north Dutch hollow pasture

- **Snowline AMP Custodial, 20607 (C) (There are no proposed management changes in other Alternatives)**

Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	126 Cattle	6/1-10/31	100	Active	634
Specified Grazing System	N/A				
Grazing Rotation/Terms	Livestock will be authorized for 15 days in the Big Beaver Creek Pasture. Lessee will eliminate trailing along reach 946.				

- **Snowline Isolated, 20719 (C) (There are no proposed management changes in other Alternatives)**

Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	33 Cattle	6/1-10/31	100	Custodial	161
Specified Grazing System	N/A				

Table 2.1 Alternative A (Current Livestock Grazing Management)						
Grazing Rotation/Terms	N/A					
• **Straight Creek Non-AMP , 10697 (C)** **(There are no proposed management changes in other Alternatives)**						
Mandatory Terms and Conditions	**Authorization**	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	2502681	4 Cattle	5/15-12/30	100	Active	30
	2505178	9 Cattle				68
Specified Grazing System	N/A					
Grazing Rotation/Terms	N/A					
• **Truax Creek, 20642 (C)** **(There are no proposed management changes in other Alternatives)**						
Mandatory Terms and Conditions	**# and Kind**		**Season of use**	**% PL**	**Type Use**	**AUM's**
	19 Cattle		7/1-11/1	100	Active	77
Specified Grazing System	N/A					
Grazing Rotation/Terms	N/A					
• **Williams, 20195 (I)**						
Mandatory Terms and Conditions	**# and Kind**		**Season of use**	**% PL**	**Type Use**	**AUM's**
	136 Cattle		5/9-6/30	97	Active	230
Specified Grazing System	Rest Rotation (See Cedar Creek Above)					
Grazing Rotation/Terms	N/A					
• **Ney Ranch Un-allotted** **(There are no proposed management changes in other Alternatives)**						
A Temporary Non Renewable (TNR) grazing authorization may be issued as a vegetation treatment, if deemed necessary by the Authorized Officer, to achieve the resource objectives of reducing fuel loading and limiting willow expansion into the wetlands. This TNR grazing authorization would likely be high-intensity, short-duration treatment, using a large number of livestock for a short period of time to reduce forage selectivity, during the late fall or early winter when soils are frozen. If feasible, prescribed fire or mechanical treatment may also be employed to achieve management objectives.						

Features Common to All Action Alternatives

This section covers proposed actions and project design features that would be implemented regardless of action alternatives or combination of alternatives chosen by the Authorized Officer.

Livestock Management

- Livestock management changes would be initiated during the 2019 grazing season. Implementation which is dependent on other proposals, e.g. rangeland projects, may take up to five years, due to financial, logistical, or other constraints.

Projects

- All projects that result in surface disturbance, and fences would require a cultural and botanical review. If necessary, a field inventory may be needed. If significant resources are present, the project would need to be modified to mitigate impacts or re-located.
- Place new, taller structures, i.e. water storage tanks, out of line of sight for at least one kilometer from occupied sage grouse leks, where such structures would increase avian predation.
- Surface disturbance resulting from project work would be reseeded with a mix of native grasses and forbs. In riparian habitats where natural recovery is expected to be rapid such as sedge mats, reseeding would not occur.
- No repeated or sustained behavioral disturbance (e.g. visual, noise over 10 dbA at lek, etc.) to lekking birds from 6:00 PM to 9:00 AM within 2 miles of leks during lekking season.

Water Developments

- All applicable State and Federal permits would be obtained and the terms and conditions applied.
- Spring sources and associated riparian wetland habitat would be fenced where appropriate to exclude livestock use on developed springs. If conifer encroachment is noted as degrading spring and riparian wetland function, the conifers would be removed from within the riparian and spring area during development.
- Any proposed pipelines and water troughs would be located in existing disturbed areas or unsuitable sage grouse habitat to the extent practical.
- Flow measurements would be gathered at springs proposed for new development. Springs that have inadequate flows to provide a reliable water source for authorized livestock, while maintaining wetland/riparian habitat would not be developed. Adequate water would be left at the spring source to maintain wetland hydrology, hydric soils, and hydric vegetation.
- Float valves on troughs/tanks and other design features would be installed to allow full discharge at the source when the troughs are full or not in use.
- No new roads would be authorized as a result of water developments. Permit holders may be authorized to travel along pipeline routes to perform maintenance as defined in the terms grazing permit.
- All old surface materials (pipeline, troughs, head boxes, etc.) would be cleaned up and removed when springs are re-developed, maintained, or abandoned.
- Soil disturbance resulting from pipeline installation would be seeded with a native seed mix during the fall following construction.

- Prior to pipeline installation, special status species surveys would be completed to avoid habitat and/or apply timing stipulations, if needed.
- State of Montana water Right laws and administrative procedures would be followed in applications for Water Rights on Public Land. The BLM would limit maximum flow rates to 35 gallons per minute or less and maximum volumes to 10 acre-feet or less for new developments. The BLM would submit proposed changes to the Montana DNRC and comply with Public Notice requirements for changes to existing water rights. Approvals would be obtained prior to construction where additional stock tanks resulting in new points of use are added to existing systems and changes to existing water right claims would occur. Applications for new water rights would be submitted after construction in most cases. The BLM is committed to respect water rights of all parties and would not knowingly infringe on other water rights holders.
- Design features to mitigate potential for West Nile Virus would be incorporated into new water developments (USDI, 2015).

Fences

- Any new replacement boundary fences would normally be a four wire fence and any new interior (pasture) fence would normally consist of three wires, constructed in conformance with BLM Fencing Handbook H-1741-1.
- High tensile electric fence would be considered in areas where they may provide an effective alternative to traditional barbed wire construction. These would also be constructed in conformance with BLM Fencing Handbook H-1741-1.
- Avoid building new wire fences within 2 km of occupied leks. If this is not feasible, ensure that high-risk segments are marked to avoid collision (USDI, 2015a, Appendix C).
- New fence construction, including exclosures, that are determined to be in a high use area for sage grouse (i.e. fences within ¼ mile of a lek and/or winter concentration areas; considering topography, vegetation, visibility, etc.) would be marked with flight diverters to reduce collisions (USDA, 2012 and USDI, 2015).

Non-Commercial Mechanical/Prescribed Fire

- A burn plan would be prepared and approved prior to implementing prescribed fire treatments.
- Fire managers and range specialist would coordinate with applicable permittees to meet rest/rotation as follows; One season of rest from livestock grazing may be needed prior to burning to allow sufficient growth of fine fuels (grasses) to ensure a successful burn. At least two growing seasons of rest from livestock grazing would be required following burns to allow re-growth and re-establishment of vegetation in the treated areas.
- Treatment units would be monitored for noxious weeds and cheatgrass, and treated both pre and post-treatment. Areas where cheatgrass or noxious weed densities are greater than 50% of vegetative composition and the size of the infestation is larger than five acres would be excluded from the treatment unit. Burned areas would be treated intensively during the spring and summer following the burn to prevent re-emerging or germinating noxious and invasive species from producing seed.
- Staging areas to complete treatment would be located in areas free of, or treated for, noxious weeds.

- Temporary fencing or hot tape (electric fence) may be used to allow the appropriate rest before or after a prescribed fire treatment.
- Units would be burned as fuel and weather conditions allow. Fire mangers would coordinate the timing of prescribed fire treatments (seasonally) and the area treated per year to minimize public resource use conflicts.
- Fire managers and wildlife biologists would coordinate the timing of prescribed fire treatments (seasonally and yearly), and the area treated per year to minimize conflicts with wildlife.
- Fire managers and hydrologists/soil scientists would coordinate to minimize potential for excess sediment contribution to nearby waterways as a result of a prescribed fire treatment. Site selection (slope) and time of year (spring vs. fall) would typically mitigate for potential sediment run-off. If necessary, prevention and protection strategies as outlines in Interagency Burned Area Emergency Response Guidebook could be implemented (USDI/USDA, 2006).
- Prior to implementing prescribed fire treatments, the BLM invasive and noxious weeds specialist and fire managers would coordinate timing and control efforts to prevent the introduction of weeds to a treatment area, and/or prevent the spread of existing noxious or invasive weed species.
- Treatment would not occur from 6:00 P.M. to 9:00 A.M. within two miles (3.2 km) of sage grouse leks during the lekking season from March 1 – May 15.
- Burn units would be surveyed for special status species prior to the burning event and appropriate stipulations would be implemented to mitigate impacts to these species.
- Off-road vehicles and equipment would be required to be pressure washed to remove weeds and weed seeds prior to starting operations.
- Prioritize mechanical removal of conifers within up to three kilometers (1.86 miles) of occupied sage grouse leks (USDI, 2015a) considering sighting distance, topography, existing forest habitat, etc.

Forest and Woodland Treatments

Commercial Harvest Treatments

The following design features would be common to all commercial harvest treatments.

- State of Montana Best Management Practices (BMPs) and the Streamside Management Zone (SMZ) laws would be followed for all treatments or road activities in or near riparian areas. Guidelines as described in the Montana Guide to Streamside Management Zone Law and Rule 2006 would be the minimum standard design features unless alternative practices authorizations are obtained.
- If market conditions permit, biomass material may be removed from within treatment units. Sufficient residual biomass material would be left on site to maintain nutrient recycling and desirable micro-site conditions.
- Existing roads which are not designated open routes may be used for Forest and Woodland Treatments, and may be physically closed following completion of use.
- Forest and Woodland Treatment units would be monitored for noxious weeds and cheatgrass and treated where detected.
- Forest and Woodland Treatment units would be surveyed for raptor nesting prior to implementation. If a raptor nest is found in a treatment unit, timing stipulations would be

enforced to avoid disturbing nesting activity and a no-cut buffer around the nest may be applied, if applicable.

- Foresters, fuels specialists, and wildlife biologists would coordinate the timing of forest and woodland treatments (seasonally and annually), and the area treated per year to minimize conflicts with wildlife. If warranted, seasonal timing restrictions may be specified in treatment contracts and/or burn plans.
- Commercial harvest activities should not be completed during the big game wintering period from December 1st – May 15th.
- Food storage stipulations would be included in timber harvest contracts to reduce conflicts with bears.
- Treatment areas for commercial harvest are shown on Map 5 in Appendix A.
- Sale contract terms would be between 12 -36 months. Factors influencing timing would be dependent on the size of the treatment unit, wildlife considerations, and/or area closures.
- Conventional ground-based harvesting and/or cable yarding equipment would be used. Ground based harvest techniques would include hand or machine felling (on slopes <45%) and then tractor and/or cable yarding the merchantable timber to landings. Ground-based harvest equipment generally requires yarding distances of up to 1,500 feet for practical operations and access to log landings.
- Standard timber sale contract provisions which provide protection from erosion, sedimentation, and soil compaction would be adhered to. Timber sale contracts would be made available to the general public upon advertisement.
- Off road vehicles and equipment would be required to be pressure washed to remove weeds and weed seeds prior to starting operations.
- Log landings would be located in areas free of, or treated for, noxious weeds. Upon completion of use, landings would be reseeded with native grasses/forbs.
- Use of existing roads would be evaluated on a case-by-case basis to determine if additional safety and/or watershed protection measures would be needed. Upgrades may include but would not be limited to: blading, filling in low spots, installing drain dips, removal of established vegetation within the right-of-way for sighting distances, and minor re-routes of up to 500 feet.
- Construction standards on new temporary roads would be met to the minimum requirements for safe transport of merchantable material. Road locations would be designed to minimize stream or wet area crossings. Exact road locations may be adjusted for archaeological and/or sensitive plant clearances, to avoid wet areas, to adhere to SMZ laws, to provide best access for yarding, or to reduce the amount of road building. Road mileage amounts identified in this EA would not be exceeded without additional NEPA clearance.
- All applicable State and Federal Permits required for the installation of stream crossings within the project area would be obtained, and permit conditions would be followed.
- All new temporary roads used for forest health treatments would be re-contoured/reclaimed and closed upon the completion of forest management activities. Post-treatment road closure may include construction of berms and/or placing slash material on the road surface to prohibit vehicle use and reseeding with native grasses/forbs.

- Prescribed burning treatments to consume residual slash and/or to kill understory conifers less than 30 feet tall may be completed within all commercial harvest units; predominately in Douglas-fir/mixed conifer stands.
- Contract stipulations for temporary skid trails would address spacing and slopes allowed for trails as well as avoidance areas. Constructed trails may be allowed where necessary with restrictions based on local site conditions. Rehabilitation of constructed trails and any other main trails would be required upon completion of harvest operations.
- Haul routes for removal of commercial product would be determined by utilizing public access routes where feasible. Sale purchasers may elect to utilize access through private lands.

5-Needle Pine Treatments

- Planting of whitebark and/or limber pine seeds or seedlings may be completed on a case-by-case basis in suitable habitats including, but not limited to: areas burned by wildfire, areas that have experienced extensive over-story mortality from mountain pine beetle and/or white pine blister rust, areas with low age class diversity, or where natural regeneration is not occurring within existing five needle pine habitat. Actions completed for the protection/enhancement of whitebark and limber pine within the WSA would be conducted in compliance with Manual 6330 – Management of Wilderness Study Areas.
- Competing conifers may be cut within the immediate vicinity of healthy whitebark and/or limber pine trees to reduce the likelihood of damage to five needle pines in the event of a wildfire.
- Where natural whitebark pine regeneration is establishing, dead trees may be hand felled to protect against trampling (wildlife and/or livestock) in areas of concern. This would be isolated to small areas less than one acre in size and within areas that protection of the regeneration is a high priority (i.e. where mature tree mortality from mountain pine beetle is high).

Stream Crossings:

To improve stream function and riparian conditions, existing stream crossings would be improved. Stream crossing improvements would adhere to the following guidelines:

- All applicable State and Federal Permits would be obtained and all permit conditions would be followed for construction of stream crossings.
- Where applicable, culverts should be sized adequately for fish passage.
- All culverts would be sized with enough capacity to handle large flow events (2 year to 50 year return interval depending on site specific conditions and needs) so as not to restrict flow at the site.
- The most appropriate stream crossings, e.g. culverts, hardened crossings or temporary bridges, would be selected based on site specific conditions and impacts: floodplain fill, economics, road safety as well as long term impacts to stream channel function (e.g.; scour/deposition) and vegetation.
- Temporary and/or permanent culverts placed under roads would be adequately sized to maintain stream dimensions, patterns and profiles.

Riparian, Wetland, and Aquatic Habitat Enhancement or Restoration:

Common to all action alternatives is a range of programmatic watershed improvement actions grouped into categories as described in items A though C below. The restoration or enhancement action descriptions may include design features built into the description for that specific action. Project Design Features (PDFs) common to all actions are included at the end of this section, following the action descriptions. Project design features are included in the Action Alternatives for the purpose of reducing or eliminating adverse environmental effects that might stem from project implementation. The PDFs identified for the proposed action would be considered with each project. However, only those that are appropriate to the location and activity would be selected.

A list of project areas identified during the 2017 assessment and applicable programmatic actions for each potential project are included in Table 1, Appendix E.

Site specific projects identified in the future would be assessed for consistency with the scope and effects addressed in this EA. To ensure consistency and to examine site specific conditions and effects, the BLM would determine NEPA adequacy through interdisciplinary review prior to any project implementation. The determination would examine the project's location and proposed activities and identify applicable project design criteria. Projects found to be consistent with the scope and effects found in this programmatic alternative would be implemented; those that do not would be modified to be consistent with the alternative, or would require a separate NEPA analysis.

WSA's are excluded from the proposed programmatic riparian and aquatic habitat enhancement/restoration actions as a programmatic analysis would not be appropriate given the requirements of *Manual 6330 - Management of BLM Wilderness Study Areas.*

Stream Restoration and/or Enhancement

Objectives

Stream restoration and enhancement projects aim to improve stream function and both instream and riparian habitat conditions. As described in Chapter 3, stream morphology across the field office has been altered by historic management including dredge mining activities, overuse by livestock, and roads or road crossings resulting in degraded conditions. The objectives for most stream restoration projects would be multi-faceted and would intend to:

- restore a channels ability to achieve and sustain typical rates of bed and bank scour;
- achieve and sustain typical rates bedload/sediment transport and deposition;
- improve the hydrologic function of floodplains and their ability to support riparian vegetation to their full extent;
- stabilize stream banks.

Instream habitat conditions would improve as a result of improved stream function and/or projects may be identified with enhancement of habitat conditions as the primary objective.

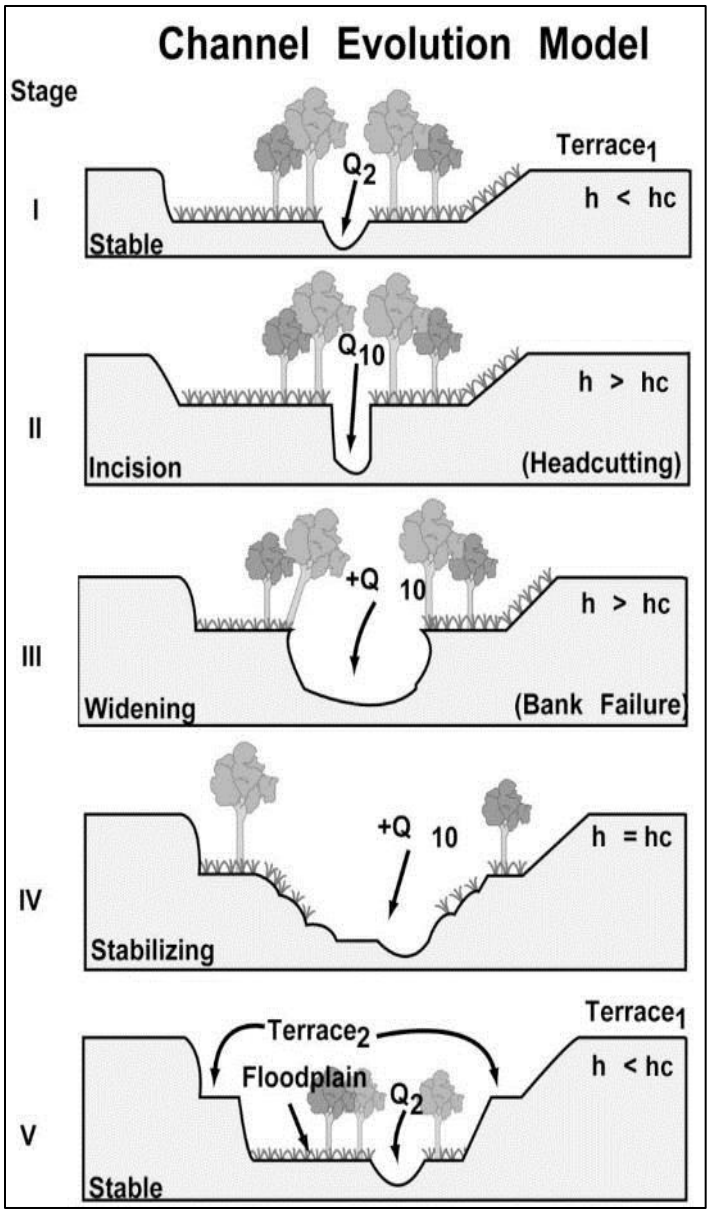
Actions:

Induced Meandering

Actions would include the placement of structures constructed of woody material, rocks, posts, stakes, or a combination of the above to assist a channels ability to restore itself from past disturbance. After disturbance (natural or imposed), a stream channel will eventually restore itself to a state of dynamic equilibrium (Zeedyk, 2009; Rosgen, 2006). The timescale for which

this will happen varies depending on the many factors including climate, hydrologic regime, sediment regime, slope, and others not listed here. During a channel's return to its natural state of equilibrium or its "potential", the channel will progress through a series of steps referred to as channel evolution. An example of a stream channel evolutionary sequence is shown in Figure 2.1 below. Induced meandering is a technique that utilizes the streams energy to accelerate this natural evolutionary process.

FIGURE 2.1: CHANNEL EVOLUTION



To accelerate channel evolution, structures would be placed within the bank full elevation of a given stream channel to deflect or direct water laterally towards, or away, from its banks; and/or stabilize the streambed vertically. Deflector structures that direct water towards a bank are meant to accelerate lateral migration of an entrenched channel by increasing erosion on the opposite outside bank while simultaneously encouraging deposition and point bar development on the near bank. When applied to incised or entrenched channels, induced erosion and deposition would expedite meander formation, channel widening, channel lengthening, and retention of sediments as bank deposits form a new floodplain (Zeedyk, 2009). The intent is for the deflector structure to gradually disappear from view and utility as newly deposited sediment and vegetation assume the role of maintaining the scour and depositional features. To maintain streambed elevation, installation of grade control structures across the channel would be utilized to abate channel incision and maintain current stream grade or make minor adjustment in channel slope to enhance deposition and/or scour. Often both tools would be utilized or integrated into one site as they complement each other.

Structures may be constructed of either rock or woody material depending on site conditions and material availability. Rock used may be imported angular material or native cobble/rubble harvested from on-site or instream. The size and quantity of rock used would depend on what's needed to provide the desired stability of the structure. In addition to or in place of rock, wood

posts or stakes may be driven into the streambed to hold smaller woody debris or bedload that is placed during construction and/or captured during high flows. Woody debris (logs, stems, branches, whole trees, etc.) and woody materials (poles, stakes, etc.) may be utilized independent of rock where conditions warrant.

Implementation would be completed using heavy equipment and/or hand tools depending on site requirements. Installation of some structures would require excavation into the streambed and/or banks to provide structure stability and to achieve site objectives. Deflector structures may extend anywhere from 30% to 75% into the bankfull width or may extend across the width of the channel as deemed necessary to meet objectives. Structure length parallel to the channel may extend up to four times the bankfull width. Structure height would vary across its footprint and may equal bankfull elevation for a percentage of its profile in order to deflect water and stream energy effectively during high flows. Structures would be spaced longitudinally down the channel to encourage the expected sinuosity and slope of a given channel based on the valley type and streambed material. Structure location would also consider sediment production by eroding a selected bank and the expected benefit from doing so. If the sediment production by eroding a high bank may cause more adverse effects then benefit to the ecosystem that site would be abandoned and a lower terrace bank may be selected. Design would attempt to space structures with the intent that the majority of sediment produced would be captured by creation of a new lateral/point bar behind downstream structures (a.k.a.; new floodplain development).

Grade control as described under this action would not have the primary objective of raising the streambed elevation but rather maintain elevation as deflector structures concentrate energy. Grade control would ensure the desired lateral scour of streambank occurs rather than incision into the streambed.

Induced meandering is not appropriate for all channel types. Zeedyk and Clothier (2009) recommend Rosgen Channel Types G, F, A and sometimes Bc with the purpose of the treatment to move the evolutionary process towards Rosgen C or E types as appropriate. Site selection for induced meandering would focus on areas where disturbance has induced channel incision or the channel was straightened and channelized following placer operations or to accommodate adjacent road prisms.

BLM stream reach channel types are based on existing morphological conditions, not their potential. Where site potential may lend to C or E channel types or where a G channel may have a potential for stability at a B channel, induced meandering would be considered a viable treatment option.

Grade Control

Unlike grade control as described in the induced meandering section above, grade control structures covered under this item would be installed with the intent to raise and restore streambed elevations to utilize adjacent floodplains for flood flow, sediment storage, and water storage.

Similar to induced meandering, structures may be constructed of either rock or woody material depending on site conditions and material availability. Rock used may be imported angular material and/or native cobble/rubble harvested from on-site or instream. The size and quantity of rock used would depend on what's needed to provide the desired stability of the structure and the channel. In place of rock, wood posts or stakes may be driven into the streambed to hold smaller

woody debris and/or bedload that is placed during construction or captured during high flows. Large woody debris (logs, whole trees, etc.) may also be utilized to span the channel where opportunities exist.

Site selection for the installation of grade control would target entrenched channels with adjacent floodplains that have been disconnected and abandoned. Evidence of once-hydric soils and/or decadent riparian deciduous vegetation (e.g.; willows, aspen, dogwood) with or without the encroachment of non-riparian species onto the terrace or topographic flat adjacent to stream channel may indicate a drop in the water table caused by channel incision. Channels that cannot access their floodplains to dissipate energy may also have streambed materials coarser then optimum compared to reference conditions or vertical banks void of vegetation. These conditions would indicate an incised channel as high energy flood flows are contained within the banks increasing shear stress on streambed and bank materials, increasing the streams capacity to mobilize larger bedload and bank material.

Dependent on each individual site, structures would be keyed into the streambanks and streambed to prevent scour around or under the structure. Structures may be keyed into streambanks equal to two times the current channel width on both sides of the channel. As design determines, structures would be keyed into the streambed to maximum scour depth or bedrock. Heavy equipment or hand tools would be used to install structures.

Grade control structures would typically be placed systematically throughout the length of the channel at elevations that would support the desired stream gradient. Where the intent is for grade control structures to be incorporated into the riffle-run sequence, length of the structure would continue longitudinally down the channel a distance at least equal to the bankfull width gradually tapering down in elevation both upstream (mimic pool tail-out) and downstream. Cobble and gravel would be the material of choice for these structures. Where woody material is used, the vertical drop from the crest of the structure to the downstream water surface may be more abrupt and represent a structure similar to what a beaver may build. Large angular rock (two to four feet in diameter) may be necessary to control grade of higher energy systems. Where large angular rock or wood material is used, the structure may become a series of step pools as the total vertical drop is spread out over each step making each drop less dramatic. Structures would be designed to accommodate aquatic organism passage as needed.

Head-cut Stabilization

A head-cut can be defined as a sudden change in elevation or nick-point in the streambed. Often, the channel downstream of the head-cut is incised and disconnected from its floodplain as the head-cut has already moved through that section of channel while the area upstream is not incised and has a well-connected floodplain. The objective of a head-cut stabilization structure would be to halt channel incision from moving upstream.

To stabilize the head-cut, the face of the head-cut and the scour pool immediately downstream of the head-cut (if present) would be armored. All materials and techniques described for grade control structure above would also apply to stabilization of a head-cut. Other than the objective, a primary difference between a grade control structure and head-cut stabilization structure would be the top elevation of the installed structure. The highest point of the head-cut stabilization structure would not exceed the streambed elevation immediately upstream of the structure. The highest portion is typically the upstream most portion of the structure and it would match elevation or be slightly lower so as not to encourage water around the structure.

Floodplain Grading

In areas disturbed by past earth moving activities, floodplains were often not left to accommodate flood flows. Where dikes, levees, or other features constrict or segregate portions of otherwise usable floodplain, the materials would be removed or redistributed to allow flood flows to access all usable floodplain. In the case of disturbance caused from past placer mining, the material to be removed or redistributed is typically the larger alluvium left as by-product during placer operations as the smaller gravels and sands within the alluvium were targeted during the search for gold or silver. This action includes reconnecting side channels and off-channel habitat that may be cut off by sediment, or alluvium or may be disconnected by an entrenched channel.

Construction could involve the use of heavy equipment such as excavators, loaders, backhoes, and dump trucks. If the material can be effectively redistributed, graded to match desired floodplains elevations, or utilized for other adjacent restoration action (e.g.; instream grade control), that would be the preferred method of eliminating the restriction. If the volume of material is too great to redistribute, the material would be excavated and relocated out of the riparian area or loaded directly into a truck for disposal off-site.

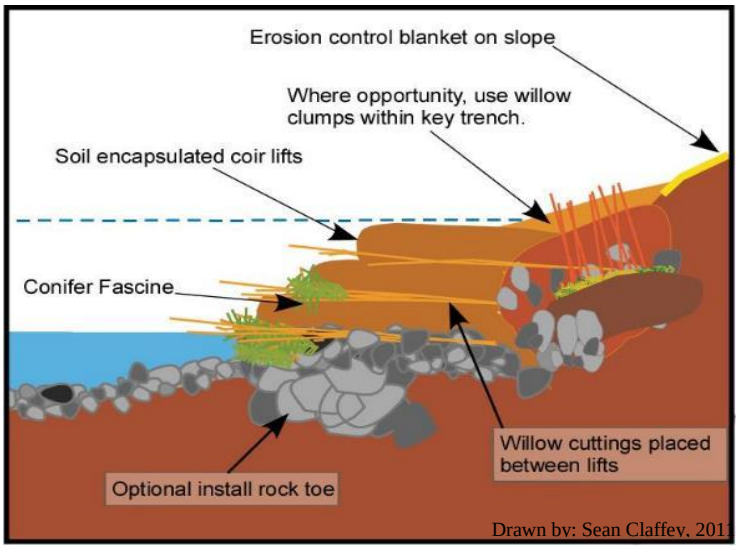
Streambank Stabilization

Unstable banks that are a chronic source of sediment may be stabilized using large rock, bioengineering techniques that utilize fabric and vegetation, or a combination of the two. Banks targeted for stabilization would be where erosion has been accelerated by anthropogenic influence or where existing or proposed infrastructure is threatened.

Where infrastructure is threatened, large angular rock may be imported and placed to rip-rap the bank and permanently halt lateral migration. If rip-rap is used, willow cuttings would be incorporated into the voids of the rip-rap by hand, or planting would be assisted by a stinger attached to an excavator or backhoe. Rip-rap would be keyed into the streambed below scour depths and continue to the top of the bank or to flood prone elevation (two times bankfull elevation).

As conditions allow, the preferred technique would be a bioengineering solution that would utilize biodegradable erosion control fabric and/or coconut fiber (coir) logs, woody debris, and vegetation. Typically woody debris would be placed to roughen the toe of the bank followed by 12-18 inch lifts of soil wrapped in fabric to the desired elevation (Figure 2.2). Below each soil encapsulated lift a layer of willow cuttings would be placed at a rate of 8-10 cuttings per foot.

FIGURE 2.2: CONCEPTUAL DEPICTION OF BANK STABILIZING USING BIOENGINEERING



If infrastructure is threatened and the site allows, a combination of techniques may be utilized. Rip-rap or the largest naturally occurring cobble would be placed as a rock toe then bioengineering would stabilize the bank above the toe. Where shear stresses allow, cobble would be the preferred material for a rock toe. This method would stop lateral migration but maximize the opportunity to restore vegetation along the channel.

Another option to halt erosion on a streambank would be to install a vane (or barb) to deflect water away from the bank. A vane is an upstream pointing barb used primarily to divert high velocity flow away from a cut-bank typically on the outside of a meander bend (Zeedyk, 2009). Structures could be constructed of woody material, rocks, posts, stakes, or a combination of the above. Rock used may be imported angular material or native cobble/rubble harvested from on-site. The size and quantity of rock used would depend on what's needed to provide the desired stability of the structure. In addition to or in place of rock, wood posts or stakes may be driven into the streambed to hold smaller woody debris or bedload that is placed during construction and/or captured during high flows. Woody debris (logs, stems, branches, whole trees, etc.) and woody materials (poles, stakes, etc.) may be utilized independent of rock where conditions warrant.

Vane installation would be completed using heavy equipment and/ or hand tools depending on site requirements. Installation of some structures would require excavation into the streambed and/or banks to provide structure stability and to achieve site objectives. The angle of incidence of the vane with the bank should be 20 degrees or less (Zeedyk, 2009). Structure height would vary across its footprint and may equal bankfull elevation for a percentage of its profile in order to deflect water and stream energy effectively during high flows. The design of vanes would be completed in reference to guidance provided by Zeedyk and Clothier in their 2009 publication "Let the Water Do the Work" as well as other technical publications on the subject that are, or may become, available.

Instream Habitat Restoration and Enhancement

Where anthropogenic influence has simplified instream habitat by altering typical rates of bed/bank scour and/or depositional patterns, action would be taken to manipulate instream channel features to diversify available habitat.

Examples of anthropogenic influence include (but are not limited to): upstream flow regulation, road/trail encroachment or crossing, channel straightening, large woody debris (LWD) removal, alteration of LWD recruitment rate, impoundments, sediment input, historic mining, and historic livestock use. Each one of these examples alters stream habitat by altering how the stream can dissipate energy. Typically stream energy is either increased or decreased and can happen at a very site specific scale (e.g.; a single meander bend) or on the reach scale (e.g.; an entire river downstream from a reservoir). An increase in energy will increase the streams capacity to mobilize size and quantity of bedload and can increase ability to scour banks. Conversely, a decrease in energy will inhibit the streams ability to transport bedload or sort sediments and inhibit its ability to scour its bed and banks. The result of each can be a homogeneous channel cross-section resulting in simplified aquatic habitat. This process will be further described in chapters 3 & 4.

One technique to restore or enhance instream habitat where the above conditions apply would be to use heavy equipment (e.g.; tracked excavator) to redistribute bedload instream. If conditions suggest that stream energy has been reduced and the channel lacks bed scour (pools, runs) and

associated depositional (point bars, lateral bars) features, heavy equipment could be used to excavate pools and redistribute that bedload to form adjacent point or lateral bars. The excavated bedload may also be used to raise or shape the riffle upstream of the excavated pool to manipulate slope or flow direction to enhance scour. Excavated pools, constructed bars, and enhanced riffles would be built with native streambed material therefore they would be deformable during annual large flow events. While these features may adjust in size, shape, or location during annual large flow events, they would persist as they would be strategically placed and shaped to create self-sustaining habitat features. Similarly, an increase in stream energy caused by straightening of a channel can simplify habitat as stream velocity is more uniform across the channel cross-section reducing differential scour and deposition. If the channel must stay in its current alignment, heavy equipment may also be used instream to improve habitat. If adequately sized native bed material is present to build instream features that would persist, material would be sourced from the channel to enhance pool features and redistributed to enhance riffle and bar features. If the size material needed or the quantity needed is not available instream, material would be introduced from off-site to accomplish objectives. Introduced material would be washed river rock from existing quarries and would be sized to mimic the largest naturally occurring substrate in the stream unless larger material must be used to insure stability. Larger material would be used only in cases where anthropogenic influence has increased energy over the threshold of want native sized material could withstand. All rock sources would be weed free.

In some stream systems large woody debris (LWD) within the channel provides for areas of focused energy dissipation which results in complex habitat. Where it is determined that the LWD component is missing from a stream or the recruitment potential has been reduced, LWD may be placed instream and/or on the floodplain to diversify or enhance scour and deposition. LWD placement may be accomplished by crews with hand tools or heavy equipment. Excavation into the streambed or banks may be necessary secure LWD in place. LWD may be placed in clusters to mimic log jams or placed as single trees and root wads may be left attached to all or a portion of placed trees. Large wood would be sourced from within the riparian or surrounding uplands following the included design features, or hauled in from off-site from another approved source. For purposes of this EA, LWD is defined by and relative to the size of the channel and can vary with channel dimensions from less than one foot in diameter to over 2 feet in diameter and can be as long as full tree length.

Where streams are wide enough, work would require equipment such as a tracked excavator or front end loader to enter the channel and work from the hard stream bed. Where channels are too small to accommodate equipment, an excavator may work from outside the channel but off of the streambanks. Tracking over streambanks would be limited to naturally hard egress points (point bars, lateral bars), where bank height is low, and where one point provides access to the greatest amount of stream to limit the number of egress points needed.

All design features included in this EA and all guidelines provided by regulatory agencies during the permitting process would be adhered to during implementation of this action.

Channel Relocation

The action of channel relocation includes relocating all or a portion of stream discharge into a previously abandoned channel or flow path or into a newly constructed channel. In cases where

achieving the objectives for stream restoration/enhancement cannot be met in the existing flow path, this action may be the most appropriate treatment alternative.

Where stream discharge has been completely or partially captured in an artificial feature such as a ditch, road, or trail, it would be desirable to relocate flow back into the abandoned natural channel to reactive and restore instream and riparian processes. Manipulation of the reactivated channel may be necessary with hand tools or heavy equipment prior to and after receiving flow.

Wetland and Mesic Restoration and/or Enhancement

Objectives

The following action items encompass wetland habitat and mesic habitat. These features may have intermittent, ephemeral, or interrupted hydrologic regime or may be supported by a shallow ground water table. The proposed action to improve these resources is meant to restore duration and extend water retention in these habitats.

Actions:

Water Spreading and Slowing Structures

Flow spreading and slowing structures are similar in function to grade control structures described for stream restoration. Where wetland and mesic habitat degradation has created concentrated flow paths that drain an area prematurely, structures would be installed to slow and spread flow over the wetland or mesic area. These structures include techniques that utilize rock, sod mats, native soils, woody material, geotextile fabric or any combination of the above. Regardless of the material used, over time these structures are meant to incorporate themselves into the environment as vegetation overtakes or replaces the constructed features. Many techniques to disperse and slow flow have been described in a technical bulletin produced by Quivira Coalition and Bill Zeedyk (Quivira, 2014). A sample of specific techniques provided in the technical document is included below. Techniques utilized on a site specific basis may follow these techniques as described, or the concepts may simply be applied to meet similar objectives.

Grade Control: Grade control for wetland and mesic restoration would slow intermittent or ephemeral flows allowing a greater opportunity for surface water to move laterally into the meadow alluvium. Rock, sod, woody material, erosion control fabric, or a combination of the above may be used. Structures would occupy the entire width of the flow path and length parallel to flow would vary depending on the size of the channel or gully. The wider the flow path, the longer the structure would be to insure stability. The height of these structures off the channel bottom would typically range from 6 inches to 12 inches high. The transition from the top of the structure to native ground would be sloped so there is no area of focused energy dissipation or the native surface would be armored to reduce the likelihood of scour undermining a structure. Depending on the scale of the site and the material to be used, work could be completed by hand or by a small piece of equipment such as a skid-steer or small excavator.

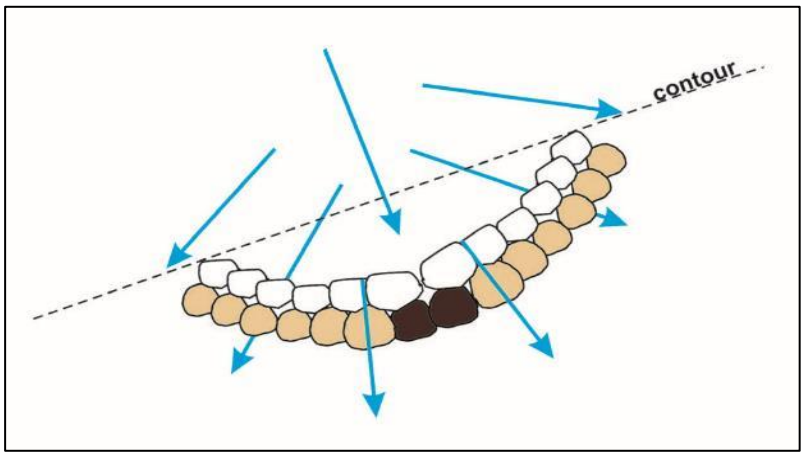
Plug and Spread or Plug and Pond: The plug and spread/pond structures may be constructed with a small bulldozer, a skid steer, excavator, or a combination of the above. This method is a grade control structure or plug, constructed of material excavated within and/or adjacent to the flow path that would serve to spread the flow over a larger area. These structures are limited in depth to 1.5 to three feet, do not stay flooded except during rain events or spring runoff from snowmelt, and are intended to fill in with hydrophytic vegetation within a year or two of being

built that way the pond can become an emergent wetland, not a deep narrow pond like a stock pond. The outlet of the new pond plug would be designed to spill water into new channel or for re-creating conditions of sheet flow. If the objective is to reestablish sheet flow, the outlet spillway should be as wide and flat as possible. In some situations, a second spillway may be desirable. The plug for the pond would be vegetated with appropriate riparian species, such as sedges and willows. Outlets and spillways would be armored with sod or appropriately sized rock for grade control. The plug and spread and the plug and pond are a means to plug gullies to raise the water table, increase the size of wetlands, and spread water over a larger area to reconnect the channels with their floodplains. They also function to counteract the effects of artificial flow paths or incision and restore hydrologic connectivity with wet meadows.

Worm Ditches: Worm ditches help to spread water and re-wet meadows that are drying out due to head-cuts causing incised gullies that no longer allow water to spread and infiltrate the meadow as they once did. It is not intended to be used on a stream. Worm ditches would be constructed as a channel six to 18 inches wide and six to 12 inches deep and would bisect the current path of concentrated flow (gully) and distribute flow laterally across the slope of the wet meadow. The purpose is to allow water to spread over the meadow or former wetland surface as it continues down gradient. Worm ditches would only be constructed where the following conditions are met: 1) there is a broad valley with sufficient space between the gully and the hill slope for the worm ditch; 2) there is a well-armored re-entry point downstream of the head-cut; and 3) wetland soils are capable of supporting a dense growth of wetland plants such as sedges. Material produced from excavated worm ditches would either be placed upslope of the ditch feature and spread into the existing slope so the increase ground surface elevation would be negligible or the material may be deposited outside of the wetland polygon. Worm ditches would typically be excavated by hand unless equipment is available and ground conditions allow access.

Media Luna: A media luna is a curving, loose rock structure, shaped like a half-moon and designed to spread or disperse water onto the wetland surface (Figure 2.3). Loose rock, usually four to eight inches in diameter is spread on the wetland surface in a band four to six feet wide and as long as needed (often 40 to 80 feet). The ends point up valley and are installed at equal elevations (on the contour). This application is for spreading water and may have applications for restoring dispersed flow to the surface of alluvial fans as well as slope wetlands. Where flow volume is small the media luna can also be built of brush.

FIGURE 2.3: SCHEMATIC OF MEDIA LUNA



Head-cut Stabilization

Similar to head-cut stabilization as defined in Item A above, a head-cut can be defined as a sudden change in elevation or nick-point in a meadow surface or gully. Often, downstream of the head-cut in a meadow a gully has formed as the head-cut has already moved through that section of the meadow while the area upstream is not incised and flow is not concentrated. The objective of a head-cut stabilization structure would be to halt incision and gully formation from moving upstream.

To stabilize the head-cut, the face of the head-cut and the scour pool immediately downstream of the head-cut (if present) would be armored. Rock (imported or native), sod, woody material, erosion control fabric, or a combination of the above may be used. Depending on the scale of the site and the material to be used, work could be completed by hand or by a small piece of equipment such as a skid-steer or small excavator. The highest point of the structure would not exceed the existing ground elevation immediately upstream of the structure, it would match elevation or be slightly lower so as not to encourage water around the structure.

PHOTO 2.1: LOG AND FABRIC STRUCTURE TO STABILIZE AN ACTIVE HEAD CUT

Wetland De-Hummocking

The purpose of this proposed action is to expedite the recovery of wetlands and wet meadows to proper functioning condition by physically eliminating wetland hummocks induced by historic livestock grazing. Wetland meadows degraded by livestock exhibit hummocks and micro-channels that can drain the wetland and lower the water table (Booth, 2014). Cattle can form hummocks through wetlands by compacting organic wetland matter into trails that dewater the wetland so that drying and erosion create and maintain hummocks (Corning, 2002).

The restoration proposed would include the use of tracked heavy equipment to physically eliminate the hummocks and restore soil elevations across the wetland complex to more closely resemble pre-disturbance conditions. Site specific design would incorporate features to encourage and improve diversity in wetland vegetative species composition and distribution. This would be accomplished by matching existing topography of the valley, drainage, or meadow and if applicable, slight undulations within portions of the restored wetland area would provide for further variation in duration of saturation.

Ground disturbing activity would occur when conditions would allow for maximum achievement of objectives. Depending on the site, timing could be optimum during driest possible conditions following the growing season (typically between but not limited to August 1 and September 30); or in the spring immediately before start of the next growing season, when the ground may be partially frozen (for example but not limited to; February 15 through April 1); or while the area is at its wettest point allowing for maximum redistribution of soil. Duration of activity at each site would vary on site size but would consist of approximately 4-8 acres per day.

The exposure of bare soil is expected to be minimal as vegetation would not be removed but possibly redistributed as hummocks are leveled into surrounding low spots. There would therefore not be large contiguous area of bare soil following construction, only patches and spots throughout. The existing vegetation is expected to quickly colonize any available bare soil created. Seed and structural erosion control measures would be applied if needed to reduce or eliminate erosion and sediment transport offsite as a result of these projects.

Riparian Planting

Objectives

Riparian vegetation projects would seek to improve or restore species composition and density of native riparian vegetation. Riparian vegetation may be altered due to changes in hydrologic regime, disruption of fire return intervals, or intrusion of non-native or invasive species. Actions to restore riparian vegetation are often coupled with another restoration action but may also be implemented independently.

Actions:

Planting

Containerized plants such as willow, cottonwood, alder, birch, or other native species would be planted within riparian areas that may be lacking in deciduous woody reproduction. Containerized stock may be plugs, bare-root, balled in burlap or paper sleeves, or potted in containers. To prevent browsing of the plantings by wildlife or livestock, individual plants may be protected by cylindrical cages made of welded wire or plastic. Only native species (plants and seed) would be used to revegetate riparian areas. All non-native materials would be removed from the site once intended results have been achieved.

Stem cuttings of willow, cottonwood or other species that are easily propagated may be used to revegetate a streambank or floodplain area. Stems may be harvested from a native stand within the same drainage as the project, or they may be sourced from commercial stock.

Container stock and stem cuttings would be planted with hand tools if hand tools can achieve desired depth to wetted soil. If soil substrate is too coarse for hand tools to penetrate, mechanized equipment such as a skid steer or excavator equipped with a stinger or auger may be used to gain necessary depth to plant.

Willow clumps may also be harvested and planted within a riparian area. An excavator or backhoe would be used to dig up the rootmass of a willow clump, keeping it intact, and then planting it in a prepared hole within the riparian area. Similar to other plantings the clumps would be planted at a depth where water is available. The hole or depression created by the clump harvest would be blended into the surrounding ground and either covered with harvested sod mats, seeded with native seed, or left for natural revegetation if the site shows a robust ability to colonize new disturbance with herbaceous and/or woody vegetation and soil stability is not compromised. Clumps would not be harvested from areas that would compromise slope or streambank stability.

Design Features

The following project design features are common to all Riparian, Wetland, and Aquatic Habitat Enhancement or Restoration projects. In addition to features described with each action description above, the design features noted below would be considered for each project and incorporated into project design and implementation where relevant. Their purpose is to reduce or eliminate adverse environmental effects that might stem from the proposed action.

- All applicable State and Federal Permits would be obtained and all permit conditions would be followed. Any design features included in permits (e.g.; timing restrictions) would be adopted and followed.
- All Best Management Practices (BMPs) included in the Dillon RMP are included as design features by reference here.
- Surveys for sensitive species would be completed and appropriate databases would be consulted prior to implementation of any project. Results of the survey would be incorporated into project design to enhance and/or protect identified populations; or an area would be eliminated from action if survey results indicate disturbance would be detrimental to known sensitive species.
- Surveys for cultural resources would be completed prior to implementation of any project. Results of the survey would be incorporated into project design to protect identified resources; or an area would be eliminated from action if disturbance to an identified resource would be unavoidable.
- Where fill is to be placed or removed in riparian or uplands, topsoil would be stripped and stockpiled for subsequent spreading during final reclamation. Stockpiles are anticipated to be relatively small (less than 10 cubic yards) and short term (less than two days) as final reclamation would happen as each site is completed. The following BMPs would also be followed:
    a. Topsoil stockpiles would be kept away from stream channels and concentrated flow paths;

b. Topsoil from riparian areas would be kept separate from other stockpiles to retain maximum volume and quality;
c. If topsoil is to be stored for more than 10 days, diversion ditches and or berms would be constructed to divert storm runoff around the piles as necessary to prevent loss of topsoil. If topsoil is to be stored for longer than 30 days, the pile would be seeded with a native seed mix.

- Weed and invasive species control would include:
  a. All equipment would be power washed, dried, and inspected, to be free of foreign debris prior to mobilizing to project site or moving from one infested project site to another. If there is to be any work done where the equipment has to enter the water, the equipment would all be washed with a hot water (140°F or hotter) power-washer before entering the project area. For labor involving the use of waders, all boots and waders would be cleaned free of all debris and dried before interacting with water at a project.
  b. Project areas would be surveyed for noxious weeds and treated by hand pulling or chemical application prior to implementation to minimize opportunity for spreading induced by project operations.
  c. Following project completion disturbed sites would be monitored and treated for weeds as needed for a minimum of five years post-project.
  d. All imported material including rock, gravel, seed, plant material, and erosion control material would be weed free from a BLM approved source.
  e. When utilizing a local source of material, areas with known noxious weed populations would be avoided.
- When utilizing a local source of material, material would be utilized from areas where it may benefit the aquatic/riparian ecosystem as a whole.
- Where streambanks or streambeds are disturbed to key in a structure, the excavated material would be used as backfill around the structure. Key trenches would be backfilled and graded to match upstream and downstream bank elevations and desired streambed elevations.
- Where instream structures are used, design would incorporate natural meander frequencies and/or riffle pool sequences expected given the valley slope and channel type. When available, a reference reach of the same channel type and relative potential would be identified and surveyed to provide an example to guide design.
- Where woody debris is to be utilized for restoration or enhancement, live trees, dead trees, and/brush would be utilized from the surrounding uplands or riparian area. The cutting of live trees would be limited to conifers.
  a. Dead or dying trees and existing slash would be targeted for a source of woody debris before taking live trees where available (e.g.; slash from previous conifer treatments).
  b. Live tree utilization would target hazard trees along adjacent roads, recreational areas within the project area or selectively cut near the worksite.
  c. Though Montana SMZ law and rules don't apply to non-commercial projects, the tree retention principles identified in the SMZ handbook would be followed to the extent practical.
  d. A BLM forester would assist in the selection of trees to be cut in order to retain stand integrity and identify opportunity to improve the stand.

- As needed, biodegradable erosion control blanket would be used to cover exposed soils. Wattles, silt fence, and/or slash would be used to trap sediment or break up concentrated flow paths over exposed soils related to project activities.
- Equipment storage, maintenance and re-fueling within 150 feet of flowing water would be prohibited. Equipment would be inspected frequently for leaks and spill contingency materials would be kept on site at all times.
- Instream work would take place during periods of low flow.
- Where temporary equipment access trails pass through riparian areas, trails would run on hard alluvium and avoid soft soils. Only the minimum amount of vegetation would be removed for access. If access across soft soils is needed, vegetation mats made of slash or other woody debris would be used to track over to minimize disturbance and create a physical buffer to the resource. Temporary trails would be reclaimed by restoring elevations as needed, spreading seed, and scattering slash over the footprint.
- The hydrologist (or project proponent) and wildlife biologist would coordinate the timing of these projects (seasonally) to minimize conflicts with wildlife and complete applicable surveys, if needed for special status species. If warranted, seasonal timing restrictions may be specified in treatment contracts.
- Temporary fencing to exclude livestock may be required to allow site stabilization following a project. The project proponent would consult with the appropriate BLM Range Specialist during the planning phase of a project to ensure permittee/lessee input or concerns are included prior to project implementation.

Noxious and Invasive Species

- Any new noxious weed infestations would be targeted for prompt eradication before they have a chance to get well established.
- Seed head weevils, root boring weevils, and root boring moths, would be released as biological controls on larger infestations of spotted knapweed to reduce the competitiveness and help control spread of knapweed.
- Helicopter spraying would be used in conjunction with ground treatments in the area around Bell Canyon. Aerial spraying would only be used in areas that have been inventoried for special status species and all concerns have been mitigated.
- Pre and post-treatment weed inventory/control would be completed for all conifer treatments units (mechanical and/or prescribed fire). All cheatgrass infestations would be mapped into the National Invasive Species Information Management System (NISIMS). This information would be used to prioritize areas for treatment.

Alternative B

Livestock Management

Livestock management changes are being proposed for one allotment, Snowline AMP in which current livestock management was determined to be a causal factor for the allotment not meeting one or more Standard of Rangeland Health. Changes are proposed on four allotments where all standards were achieved, however changes to management were pursued to improve site specific resource concerns on a localized basis (Gallagher, Gallagher Mountain, Norris Canyon, Clark Canyon). Changes are proposed on three other allotments (Williams, Shoshone Cove, Cedar Creek) Table 2.2 lists the allotments where changes are proposed. Substantial management

changes compared to the No Action Alternative are summarized by allotment in the row titled "Changes". Additionally, projects are proposed on several allotments independently or conjunction with the changes to the livestock grazing authorization and management. For all other allotments, the current management listed under Alternative A Table 2.1 would continue for a new ten year term.

TABLE 2.2: ALTERNATIVE B (PROPOSED LIVESTOCK GRAZING MANAGEMENT)

<table>
<tr><th colspan="6">Table 2.2 Alternative B (Proposed Livestock Grazing Management)</th></tr>
<tr><td colspan="6">• Cedar Creek 10124 (I)</td></tr>
<tr><td rowspan="2">Mandatory Terms and Conditions</td><td># and Kind</td><td>Season of use</td><td>% PL</td><td>Type Use</td><td>AUM’s</td></tr>
<tr><td>62 Cattle</td><td>11/1-3/30</td><td>100</td><td>Active</td><td>307</td></tr>
<tr><td>Changes</td><td colspan="5">Season of use would change from growing season use to dormant season use</td></tr>
<tr><td>Specified Grazing System</td><td colspan="5">Dormant Season Rest Rotation</td></tr>
<tr><td>Grazing Rotation/Terms</td><td colspan="5">
<table>
<tr><th>Year</th><th>Williams</th><th>Shoshone Cove</th><th>Cedar Creek</th></tr>
<tr><td>1</td><td>Graze</td><td>Graze</td><td>Rest</td></tr>
<tr><td>2</td><td>Graze</td><td>Rest</td><td>Graze</td></tr>
<tr><td>3</td><td>Rest</td><td>Graze</td><td>Graze</td></tr>
</table>

Each allotment shall be rested once every three years
Number of livestock may vary within the authorized season of use as long as the total AUM’s authorized in each allotment are not exceeded.
If fall/winter weather conditions preclude livestock grazing on the scheduled allotments, BLM may authorize the permittee to graze livestock from 4/1-4/30

This authorization shall not permit April grazing on the same pasture in consecutive years.
This flexibility will not be granted more than 3 times over the course of the 10 year permit

If it is deemed that due to environmental conditions this season of use is not compatible with the livestock operation, the permit would be re-issued for the previous season of use and management (Alternative A) for the remainder of the permit term.

</td></tr>
<tr><td colspan="6">• Clark Canyon 30002 (I)</td></tr>
<tr><td rowspan="3">Mandatory Terms and Conditions</td><td># and Kind</td><td>Season of use</td><td>% PL</td><td>Type Use</td><td>AUM’s</td></tr>
<tr><td rowspan="2">400 Cattle</td><td rowspan="2">5/15-10/15</td><td>35</td><td>Active</td><td>654</td></tr>
<tr><td>15</td><td>Active</td><td>263</td></tr>
<tr><td>Changes</td><td colspan="5">The fence between Dry Gulch and State Buck Pasture would be moved approximately ¼ mile to the west. The State Buck Pasture would be removed from the Clark Canyon allotment and rotation. This would remove 18 AUM’s of grazing preference from the Clark Canyon grazing permit. A new allotment, State/Buck, would be created with an authorization of 2 cattle 3/1-2/28 100%PL 18 AUM’s.</td></tr>
<tr><td>Specified Grazing System</td><td colspan="5">Rest Rotation/Annual Deferred Use</td></tr>
<tr><td>Grazing Rotation/Terms</td><td colspan="5">Grazing rotation would follow Alternative A with the exception of use in the State/Buck Pasture.</td></tr>
</table>

Table 2.2 Alternative B (Proposed Livestock Grazing Management)

- **Gallagher, 20114 (M)**

	# and Kind	Season of use	% PL	Type Use	AUM's
Mandatory Terms and Conditions	140 Cattle	6/1-10/7	90	Active	534
Changes	Livestock grazing in the Upper Bill Hill Pasture would be reduced to no more than 29 days				
Specified Grazing System	Rest Rotation/Annual Deferred Use				

Grazing Rotation/Terms

Year	Lower Bill Hill	Upper Bill Hill	North Gallagher	South Gallagher	Gravel Pit	Beacon Hill	Meadow
1	Rest	8/10-9/7	7/6-8/9	6/1-7/5	9/8-9/17	9/18-9/30	10/1-10/7
2	6/1-7/5	Rest	8/10-9/10	7/6-8/9	9/11-9/17	9/18-9/30	10/1-10/7
3	6/30-8/9	6/1-6/29	Rest	8/10-9/9	Rest	9/10-9/23	9/24-10/1
4	8/5-9/8	7/7-8/4	6/1-7/6	Rest	9/9-9/18	9/19-9/30	10/1-10/7

- Grazing use in the Upper Bill Hill Pasture shall not exceed 29 days per year regardless of stock density.

- **Gallagher Mountain AMP, 30013 (I)**

	# and Kind	Season of use	% PL	Type Use	AUM's
Mandatory Terms and Conditions	995 Cattle	5/15-11/20	52%	Active	3,235
	15 Horse	12/1-5/15	45	Active	37
Changes	Number of livestock would be modified. The season of use would be deferred until May 15th. Temporary fencing would be used to split the Gallagher and Lovell's pasture. Use would follow the tentative rotation shown below, but could be modified with several sideboard requirements referenced in the "Other Terms and Conditions". Rotation schedules spring use in the Dry Mast pasture once every 4th year rather than once every other year.				
Specified Grazing System	Rest Rotation/Annual Deferred Use				

Table 2.2 Alternative B (Proposed Livestock Grazing Management)

Grazing Rotation/Terms

Year	Warm Spring	Dry Mast	East Lovell	West Lovell	Gallagher North	Gallagher South	Henneberry	Clark Canyon
	Rest every other year		Rest every fourth year					
2019	Rest	10/15-11/20	Rest		8/15-9/1 10/1-10/15		5/15-7/15	7/15-8/15
2020	10/15-11/20	Rest	5/15-6/15	10/1-10/30	6/15-7/7	7/7-8/1	8/1-9/1	Rest
2021	Rest	5/15-6/15	10/15-11/20	6/15-7/15	Rest	Rest	7/15-8/15	8/15-9/1 10/1-10/15
2022	5/15-6/15	Rest	6/15-7/15	Rest	10/24-11/20	10/1-10/24	Rest	7/15-9/1
2023	Rest	10/15-11/20	Rest	5/15-6/7	10/1-10/30	6/7-6/21	6/21-8/1	8/1-9/1
2024	10/15-11/20	Rest	5/15-6/15	6/15-7/1 10/1-10/30	7/1-7/21	7/21-8/14	8/14-9/14	Rest
2025	Rest	5/15-6/15	6/15-7/7	7/7-8/10	Rest	Rest	8/10-9/1 10/30-11/20	10/1-10/30
2026	5/15-6/15	Rest	10/1-11/20	Rest	6/15-7/7	8/7-9/1	Rest	7/7-8/7
2027	Rest	11/20-11/20	Rest	10/1-10/20	8/7-9/1	7/15-8/7	5/15-6/15	6/15-7/15
2028	11/1-11/20	Rest	5/15-6/15	6/15-7/15	10/14-11/1	10/1-10/14	7/15-9/1	Rest

- Summer grazing plan would generally follow the rotation listed above: Grazing plan may be modified on an annual basis to deal with environmental conditions, water conditions, etc. with the following requirements:
  - Grazing use does not occur during the same period in consecutive years in any pasture
  - Every pasture will be rested from grazing once out of every four years. (I.E. grazed three years, rested the fourth year). Warm Spring and Dry Mast will continue to be rested every other year.
  - Growing season grazing (5/15-9/1) shall be limited to not more than 45 days in any one pasture, and should generally be 30 days or less.
  - Hot season grazing 6/15-9/1 shall be limited to approximately 3 weeks or less in the north and south Gallagher pastures.

Table 2.2 Alternative B (Proposed Livestock Grazing Management)					
• **Norris Canyon, 20109 (M)**					
Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	450 Cattle	6/1-6/21	43	Active	72
Changes	No fall use is scheduled. 4 treatment rest rotation is implemented.				
Specified Grazing System	Rest Rotation				
Grazing Rotation/Terms	• Allotment will be grazed for not more than 10 days per season. • Allotment will be rested from grazing one in four years				
• **Shoshone Cove, 20192 (M)**					
Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	69 Cattle	11/1-3/30	50	Active	170
Changes	Change season of use from growing season to dormant season				
Specified Grazing System	Dormant Rest Rotation (See Cedar Creek above)				
Grazing Rotation/Terms	N/A				
• **Snowline AMP, 30029 (I)**					
Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	961 Cattle	6/6-10/31	42%	Active	1966
	20 Horses (Field A2 Truax Only)	10/1-4/1	19%	Custodial	23
Changes	Horses would be authorized only in the Field 2a Truax. The season of use would be extended 10 days to the end of October. Use within the Pine Butte Pasture would occur during this time to reduce potential for warm day grazing and increase potential for frozen soils. Within the Pine Butte Pasture livestock density would increase, and the duration would decrease. Additionally during years normally scheduled for spring use, a twice over system would be implemented to reduce growing season use and hot season days on the system. Not more than 14 days would be grazed during the spring. Pasture layout within the Dutch Hollow North and Fields 3A and 4A would be modified, however rotations would follow the same general rotation. Finally, if monitoring following 2 cycles does not show riparian improvement use in the Pine Butte Pasture would be reduced by 25%.				
Specified Grazing System	Rest Rotation				

Table 2.2 Alternative B (Proposed Livestock Grazing Management)

Grazing Rotation/Terms

Number Livestock	Pasture	Year 1	Year 2	Year 3
650 Cattle	Field 6	6/17-7/30	9/10-10/20	Rest
	Field 8	9/11-10/20	6/17-9/9	7/22-10/20
	Field 9	8/1-9/10	Rest	6/17-7/21
700 Cattle	South Dutch Hollow	Rest	6/21-7/21	9/26-10/17
	North West Dutch Hollow and Field A2 and A3	6/21-7/11	8/28-9/17	Rest
	North East Dutch Hollow and Field 4A	7/12-8/2	Rest	6/21-7/12
Up To 1065 Cattle	Pine Butte	10/1-10/31	Rest	6/6-6/19 and 10/16-10/31

- Until pasture layout is modified the 700 cattle herd would follow the rotation outlined under Alternative A.
- Grazing use on Pine Butte Pasture during year three is intended to be a twice over grazing plan. Harvesting all of the AUM's during the spring period is not authorized, however AUM's may be deferred until the fall use period. No more than 14 days of grazing are authorized in June.
- Riparian Multiple Indicator Monitoring (MIM) Station will be established in reach 945. Baseline data will be gathered during the rest year after 7/1. Indicators monitored will be green line to green line width, stream bank stability and cover, and greenline composition. If significant improvements are not observed after two full cycles of this new plan, authorized use within the Pine Butte Pasture would be reduced by 25% based on current permitting. The duration would not exceed 36 days (675 Cattle would be authorized to graze 6/1-7/7 year 1, rest year 2, 9/15-10/21 Year 3).Additionally 112 AUM's would be placed into suspended non-use.

- **Williams, 20195 (I)**

Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	48 Cattle	11/1-3/30	97	Active	230
Changes	Change season of use from growing season to dormant season				
Specified Grazing System	Dormant Rest Rotation (See Cedar Creek Above)				
Grazing Rotation/Terms	N/A				

TABLE 2.3: ALTERNATIVE B PROPOSED RANGE IMPROVEMENT PROJECTS

Table 2.3 Alternative B Proposed Range Improvement Projects (Please see Map 6-8 and 10-13 of Appendix A for locations of proposed projects)	
Allotment	**Project Description**
Bell Canyon	• Construct supplemental pipeline spur from the South Flats Pipeline to the North Pasture of the North McKnight Allotment. One additional water location may be provided in the South Flats Pasture as a result of this pipeline. The pipeline may be buried. If buried, a cultural review of the project area would be completed prior to implementation, all necessary mitigation measures recommended as a result of the review would be implemented. Additionally, the buried pipeline would be seeded with a native seed mix, and would be monitored for the establishment of noxious and invasive species. Two routes are shown on the map, however only one route would be constructed. • Inter-seed within portions of the North Flats and South Flats pastures of Bell Canyon, the East pasture of Roe West, and the Williams Allotment where needle and thread and Sandberg bluegrass are the dominate vegetation. A native seed mix of taller cool season bunchgrasses (bluebunch wheatgrass) and forbs would be broadcast via UTV into existing rangeland vegetation in early spring (prior to May 15). Seed would be incorporated into the soil by grazing livestock. To protect seeded areas, temporary electric fence may be needed in subsequent years while livestock graze the pasture to ensure stand establishment. Currently a one acre test plot was implemented in the spring of 2018. Depending on the results of this project, larger scale projects may prove effective. Total area proposed for treatments is approximately 1,563 acres. However the actual treatment areas would be much less based on topography, vegetative conditions, funding and cooperator support.
Cedar Creek, Shoshone Cove, Williams	• Authorize previously disturbed sites for temporary water haul locations. • Conduct inter-seeding project as discussed under Bell Canyon
Clark Canyon	• The division fence between the Dry Gulch pasture and State/Buck pasture would be re-constructed approximately ¼ mile to the west. The existing fence, burned in 2017, would be removed. The proposed fence route would be approximately 7,000 feet of new fence across BLM managed public lands. There would be approximately 5,800 feet of existing fence removed.
Gallagher	• Construct a supplemental pipeline from the Bill Hill Spring (#477205) in the Upper Bill Hill pasture to a new end tank in the Lower Bill Hill pasture. Total pipeline length would be approximately ½ mile • Install a headbox, and pipeline from Gallagher Creek (Reach 26) in the South Gallagher pasture to an end tank in the North Gallagher pasture. Total pipeline length would be approximately 0.9 miles
Gallagher Mountain	• Construct a pipeline with up to three stock water troughs in the Lovell's Pasture. Total pipeline length would be approximately 1.3 miles. • Construct an electric fence in the Lovell's Pasture, and Gallagher Pasture. Projects are shown on private land for context. This infrastructure would not require BLM approval. The fenceline within the Lovell's pasture may take one of two routes toward the northern end of the pasture. Only one route would be implemented. • Construct an exclosure fence around a small wetland area in the Henneberry Pasture. If it appears that it has the potential to provide livestock water, future development may occur.

Table 2.3 Alternative B Proposed Range Improvement Projects (Please see Map 6-8 and 10-13 of Appendix A for locations of proposed projects)	
Lima Peaks	• Re-develop spring 912 for livestock water. If feasible water may be piped to the southwest to improve livestock distribution. • Re-develop a spring collection system, pipeline (~0.3 miles), and stock tank in the Dutch Hollow Pasture.
North McKnight	• Construct a pipeline spur from the South Flats Pipeline in the Bell Canyon allotment to a new end tank in the North Pasture of the North McKnight allotment. Two routes are shown, however only one would be constructed. See Bell Canyon
Pinetop Hill	• Construct an exclosure fence along reach 992. A water gap with a hardened bottom would be provided.
Roe West	• See inter-seeding project description under Bell Canyon
Snowline AMP	• Construct livestock exclosure around reach 947, with the potential to develop the spring for offsite livestock water • Realign the Rail Road Right of Way fence or construct a new fence excluding livestock from reach 941. Two water gaps would be provided, with a hardened bottom. • Remove Non-functional tanks along reach 904. • Develop a livestock water well in Dutch Hollow North pasture. Currently there is a trough and pipeline near the proposed well site. • Remove ~1.5 miles of net wire fence between Dutch Hollow North Pasture and Field 4 (Shearing Plant) and Field 4a pastures. Approximately 0.25 miles of which are located on Montana DNRC lands, which would be coordinated with DNRC. • Install ~1.4 miles of standard 3 wire fence in the North Dutch Hollow pasture. • Modify ~.45 miles of standard fence to let down fence between the Snowline AMP (Dutch Hollow South Pasture) and Lima Peaks (Dutch Hollow pasture) to reduce snow damage and improve wildlife movement. • Install a collection box, pipeline and stock water tank from the head of reach 945. Pipeline would be less than ½ mile. • Construct ~0.5 miles of new pipeline extension and a stock water tank in Pine Butte Pasture if water production can be increased following maintenance of existing pipeline on private land. • If water is not increased following pipeline maintenance listed above, develop a spring at head of reach 904, and install a pipeline approximately 1.1 miles to a new stock water tank. • Install additional water troughs or storage tanks on the two upland tanks in Pine Butte Pasture (UTM 12T 391907E, 4934106N) and (UTM 12T 390311E, 4933577N).
Truax	• Developing spring 2402 for livestock water. Water may be piped to a tanks site along the Truax/Lima Peak fence line. Currently a nonfunctional water trough is present at this location.

Non-Commercial Mechanical/Prescribed Fire

Up to 1,186 acres of non-commercial mechanical/prescribed fire treatment is proposed under Alternative B. Treatment methods for this alternative would be a combination of cutting (lop and scatter), mastication, and/or prescribed fire. Actual prescribed fire treatment boundaries within the units identified on Map 5, Appendix A, would be based on topographic features such as ridges and drainages, and man-made features such as trails and roads. Treatments would occur in early spring or late fall to ensure existing fuels are readily available to support fire spread. Proposed treatments in Alternative B are summarized in the table below.

TABLE 2.4: NON-COMMERCIAL MECHANICAL/PRESCRIBED FIRE UNITS, ALTERNATIVE B

Unit Name	Allotment	Acres	Objective(s)	Treatment Type(s)
Eastfork	Clark Canyon	110	Reduce conifer expansion into sagebrush/grassland	Non-commercial mechanical/Broadcast Rx fire
Eastfork 2	Clark Canyon	696		
Bell Face	Roe West	380		

Forest and Woodland Treatments

Commercial Harvest

All commercial harvest actions are contingent upon access through private land.

Alternative B would allow salvage harvest of dead/dying timber, harvest of live trees, thinning of high density conifer stands, harvest of conifers in and around aspen stands, and opportunities for commercial removal of biomass. Non-commercial mechanical treatments and/or prescribed fire would also be allowed to reduce residual slash after harvest activities, promote aspen, and reduce conifer expansion into aspen, sagebrush and grasslands.

Table 2.5 outlines the proposed treatment acres, objectives, miles of temporary road, number of crossings and the affected allotments under Alternative B. Treatable acres are shown on Map 5 in Appendix A

TABLE 2.5: COMMERCIAL HARVEST UNITS; ALTERNATIVE B

Drainage/Allotment	Units	Acres	Objective	Maximum Miles of Temporary Road	Maximum Number of Proposed Crossings
Clark Canyon Allotment	1	18	Salvage dead/dying timber, reduce fuel loads, decrease future insect and disease hazard, increase stand vigor and diversity of age and size classes, maintain/enhance aspen	.5	0
	2	101		1	2
	3	120		1	4
	4	283		1	0
	5	72		1	2
	6	162		1	0
	7	332		1.75	1
	8	100		0	0
Total		1,188		7.25	9

Also see Features Common to all action Alternatives for additional design features.

Up to 1,188 acres in the Clark Canyon Allotment are proposed for commercial harvest treatment under Alternative B (Map 5 Appendix A). The areas identified for commercial harvest treatment are composed primarily of Douglas-fir with intermixed subalpine fir, Engelmann spruce, and aspen. Silvicultural

prescriptions would target harvest and removal of dead/dying trees, and harvest of conifers in and around aspen stands. Harvest treatments would aim to restore the structural diversity that occurred within the historical fire regimes. Treatments may include selective thinning and/or small patch cuts (up to five acres). At the minimum, an average of two to five existing snags or green recruitment snags would be left per acre in all commercial harvest units. Retention patches of uncut timber may be scattered throughout harvest units to provide wildlife screening cover and reduce sighting distances. In mixed conifer and Douglas-fir stands, green trees could be thinned across all diameters < 32" Diameter at Breast Height (DBH), with focus on leaving those with healthy crowns and minimal budworm damage, to create a residual stand with an average basal area of 60-80ft^2/acre with a range from 20-100ft^2/acre.

Cable yarding would be considered in areas with slopes greater than 45%, concerns with soil instability, and/or road construction limitations. Tractor yarding would also be considered where feasible. If market conditions permit, biomass material may be removed from within commercial harvest units. Sufficient residual biomass material would be left on site to maintain nutrient recycling and desirable microsite conditions. Residual slash may be burned following the completion of harvest operations.

Where viable aspen stands exist (defined as five or more live stems greater than 1" (DBH) and/or greater than 5 feet tall within a one hundred foot radius), merchantable size conifers < 32" DBH within one hundred feet from the edge of the aspen stand would be cut. Where possible, non-merchantable conifers within the same areas would be cut and left on-site as a browse barrier.

Healthy spruce and five needle pines (limber and/or whitebark pine) would not be cut unless they were deemed a safety hazard. At a minimum, an average of two to five existing snags or green recruitment snags would be left per acre within treatment units. Priority of snags to be left would be given to those with evidence of wildlife use or with wildlife-use characteristics such as forks, broken tops, or large horizontal branches. Scattered patches of uncut timber would be left within treatment units to provide hiding cover and break up sighting distances.

Up to 7.25 miles of temporary road construction and up to 9 crossings would be required to complete the commercial harvest under Alternative B.

Mountain Mahogany Treatments

Mountain mahogany seedlings would be planted within mahogany habitat in the Bell Canyon and Roe West allotments. Juniper and Douglas fir expanding into these mountain mahogany habitats would be mechanically removed and left as browse barriers around planted and young age-class mountain mahogany. Juniper and Douglas fir removal would be completed on foot with chainsaws, and would not require driving off designated routes.

Riparian Vegetation Treatments

Riparian Conifer Expansion

A variety of tools would be used to treat riparian habitat to reduce/remove conifers that are expanding into deciduous woody habitats within riparian zones. Treatments would primarily target Rocky Mountain juniper, but may also include smaller diameter Douglas-fir (< 12" DBH).

New treatments would occur on up to 8 miles of riparian habitat and one undeveloped spring where conifer encroachment was noted during the 2017 assessment. Each riparian area identified for conifer removal is classified as an aspen/dogwood, willow/sedge, or a cottonwood/dogwood habitat type; *or* the reach has segment/s of aspen, willow, or sedge communities that would be the focus area/s for removing encroaching conifers (Table 2.6 below). Some treatment would be proactive as juniper is just beginning to have a presence

within the riparian area and the deciduous woody vegetation is still relatively robust. Where juniper already has a strong presence, the deciduous and herbaceous riparian vegetation is stressed.

Table 2.6 outlines the reaches identified for potential treatments. Unit locations and boundaries are shown on Map 3-4, Appendix A.

TABLE 2.6: RIPARIAN REACHES PROPOSED FOR CONIFER EXPANSION TREATMENT; ALTERNATIVE B

Reach #	Stream Name	Functional Condition	Habitat Type	Allotment Name	Treatment miles	Treatment acres
13	Upper Bill Hill Creek	PFC	Sedge	Gallagher Mountain AMP	0.4	
14	Lower Bill Hill Creek	FAR	Aspen/ Dogwood	Gallagher	1.5	
22	Gallagher Creek Trib	PFC	Willow/ Sedge	Gallagher Mountain AMP	0.4	
75	Gallgher Trib Spring	FAR	Sedge	Gallagher	spring point	0.75 acres
80	Lovells Gulch	FAR	Willow/ Sedge	Gallagher Mountain AMP	0.65	
901	Cedar Creek	FAR-UP	Sedge	Cedar Creek	1.7	
915	Little Sheep Creek	PFC	Willow/Sedge	Little Sheep	0.2	
925	Spring Gulch	FAR-UP	Beaked Sedge	Cedar Creek	0.77	
927	Clark Canyon Creek	PFC	Cottonwood/Dog wood	Clark Canyon	0.77	
928	Lower Clark Canyon East Fork	PFC	Cottonwood/Dog wood	Clark Canyon	0.43	
929	Upper Clark Canyon East Fork	PFC	Cottonwood/Dog wood	Clark Canyon	0.26	
930	Clark Canyon Trib	PFC	Aspen/ Dogwood	Clark Canyon	0.61	
949	Clark Canyon Creek	FAR-DN	Cottonwood/Dog wood	Clark Canyon	0.27	
				Totals	**7.96**	**0.75**

Riparian conifer removal project design features:

- Though Montana SMZ law and rules don't apply to non-commercial projects, the tree retention principles identified in the SMZ handbook would be followed to the extent practical.
- In riparian conifer treatments, the goal would be to kill/remove 100% of the Rocky Mountain juniper and smaller diameter (<12") Douglas-fir within the riparian zone. The width of the riparian zone varies

depending on valley type, landform and vegetation, but treatment width would generally average 100 feet.

- Depending on the tool(s) used, a range of 80 – 95% mortality of targeted conifer trees would be considered successful. The tools that would be used include mechanical and/or prescribed fire. These treatments may be followed by seeding with an appropriate native seed mix depending on the current canopy cover of juniper and herbaceous understory composition and cover. Planting of container grown riparian vegetation following treatment may also be applicable.
- Riparian conifer treatments would not occur from May 15-August 1 to accommodate migratory bird nesting season.
- No new roads or stream crossings would be constructed to complete the riparian conifer treatments.
- Mechanical treatment would consist of cutting down or masticating the targeted conifer trees with chainsaws or mechanical equipment (including, but not limited to feller-buncher, masticator). Some of the felled conifer trees would be left on site to provide a browse barrier and stream bank protection. The felled trees that are left on site would be oriented along the stream bank and not left across or within the high water mark of the stream channel, unless deliberately placed to provide habitat benefit.
- Mechanical treatment may also lop and scatter some of the trees after they are felled or lop and pile for subsequent burning. Trees to be piled and burned would be piled outside the SMZ.
- Mechanical equipment would not get closer than 20 feet from the stream and would operate only under frozen or dry (<20% moisture) conditions. Access into the riparian zone would be perpendicular to the stream. If equipment entry in the riparian zone is necessary only one track for entry and exit would be permissible. No vehicle turning in the riparian zone would be allowed.
- Severed Douglas-fir trees between 10" DBH to 12" DBH would be masticated, chipped, cut into lengths less than six feet or removed from the site to prevent the felled trees from drawing Douglas-fir bark beetle to the site.
- No mechanical equipment would be allowed on site during wet conditions or on hydric (wetland) soils.
- Pre-treatment weed inventory/control and post treatment weed control would be completed within each unit.
- Prior to treatment implementation, permits would be made available to the general public to mechanically remove posts, firewood, Christmas trees and/or decorative wood in all units where there is public access on existing roads.
- Cultural surveys would be completed prior to any treatments using mechanical equipment.
- Effectiveness monitoring would be established in each treatment unit (refer to Appendix B for details).

Willow Regeneration

As noted in the assessment report, a BLM managed portion of the Beaverhead River, Reach #2, and the adjacent large riverine wetland complex, Reach #2401, contain large contiguous stands of decadent willow due to lack of natural disturbance. Disturbance to induce willow regeneration for these riparian areas should come from high water events scouring and depositing on the floodplain. Clark Canyon Reservoir, located upstream of these sites, has removed this disturbance mechanism. The BLM proposes the use of prescribed fire to reduce decadent willow stands and spur willow regeneration and recruitment. The wetland polygon #2401 is proposed as the treatment boundary which encompasses approximately 330 acres (Map 3 Appendix A). All design features included within the noncommercial mechanical/prescribed fire section above would apply to this action. Prescribed burning would not occur between April 15th to August 1st to avoid waterfowl and migratory bird nesting.

Travel Management:

In addition to the management identified above for All Alternatives, there would be adjustments to the designated routes identified in the 2006 Dillon RMP as amended to correct mapping errors and to address discrepancies' between maps and what is on the ground and to address changes in access opportunities on surrounding lands.

The following travel management changes are proposed for Alternative B.

In the Bill Hill Creek Area, T9S, R9W, Section 5 and 8. (Map 6 Appendix A)

Add roughly .3 miles of designated open route. This route is a well-traveled route up Long Gulch. This primitive road would be open yearlong to motorized vehicles.

Whiskey Draw/Divide Creek Area, T10S, R9W, Sections 17 & 20. (Map 8 Appendix A)

This is a mapping correction to get our maps to meet what is on the ground. BLM would close one route to motorized vehicle use, and open another route yearlong to motorized vehicle use. This would close approximately 0.5 miles of currently open route which does not exist, and open approximately 0.9 miles of route which does exist.

Gallagher Creek area, T9S, R10W, Sections 1 and 2. (Map 7 Appendix A)

Near the mouth of Gallagher Creek there are several non-designated routes and road braiding is occurring throughout the area. Under Alternative B, the primary route (0.2 miles of primitive road) would be designated open to motorized use yearlong. The road braiding would be terminated. BLM would plant sagebrush and use barriers (wood, metal, rock, or fencing) to prevent further road braiding and restrict vehicle use to the one newly designated route.

Henneberry Ridge Area T9S, R11W, Section 12. (Map 9 Appendix A)

Update mapping errors on approximately 0.5 miles of primitive road. The existing route on the ground does not match the mapped route. The proposed action would be align the mapped route to the route on the ground.

South of Clark Canyon Reservoir, T10S, R10W Section 30. (Map 10 Appendix A)

Designate .88 miles of primitive road as open yearlong to motorized vehicles. This commonly used route leads to a campsite, and stops on a hill overlooking the area.

Limekiln Canyon area, T10S, R10W Section 32, T10S, R10W Section 32. (Map 10 Appendix A)

Correct a mapping error, which would add roughly .6 miles of designated primitive road as open yearlong to motorized vehicle use. Two short routes (.4 miles and .2 miles) are both functioning as open routes. Both routes are currently signed as open on the ground and both routes connect to open routes on each end.

Bell Canyon area, T11S, R10W, Sections 17 and 20 (Map 10 Appendix A).

This area has presented challenges in travel management for years. Several routes (referred to as transportation linear disturbances) closed to motorized use continue to receive regular use. The routes designated as open to motorized use are deteriorating and causing erosion concerns. Following the 2007 RRLW Assessment process a pipeline was constructed in this area. During construction of the pipeline a new route was created. This new route is in the best condition and provides the same access as the other open and closed route. The pipeline route is the safest alternative of all the routes that exist in the area. This proposal is to close a route that is designated as open and open this newly constructed route along the pipeline. This would close .84 miles of

previously open route and open .8 miles of the newly constructed primitive road. BLM would install barriers, barrier rocks, place/plant native vegetation, signs or fences on the closed transportation linear disturbances in this area to prevent them from continuing to receive use.

McKenzie Canyon Area, T11S, R10W Sections 28 and 27. (Map 9 Appendix A)

Designate as open yearlong to motorized use, two cut across primitive roads that connect open routes on each side. These are not enforceable closures due to the wide open nature of this country, nor is there reason to keep these connection routes closed to motorized use. In section 28, around .1 miles of route would be designated as opened to motorized use in this proposal. In section 27 .17 miles of primitive road would be designated as open to motorized use yearlong.

South of McKenzie Canyon in T11S, R10W Sections 33 and 34, T12S R10W Section 4. (Map 9 Appendix A)

Correct mapping error, to get maps to match what is on the ground. Realign roughly .75 miles of open route to match what exists on the ground.

Designate .35 miles of route as closed to motorized use located in T12S R10W Section 4. This route is very rough and does not receive regular use nor does it gain any additional access. This route has been appearing on the interagency travel maps as a closed route already. This route was intended to be closed during the DFO RMP process, but was accidently left as an open route in our mapping system. This transportation linear disturbance would receive passive restoration unless use continues on the route.

North of Monida in T14S, R7W Sections 23, 26 and 25, T14S, R6W sections 30 and 31. (Map 13 Appendix A)

This route would be designated as closed to all motorized vehicles. This route is not getting regular use. Portions of this route have completely disappeared and large parts of it are barely visible. This route is roughly 3.2 miles long.

In T14S, R6W sections 32 and 33. (Map 13 Appendix A)

Designate approximately 2 miles of primitive road as open for motorized use yearlong. This route connects two designated open routes. This route is in good condition and provides good access. This is to correct a mapping error to match what is on the ground.

In the East Fork of Little Sheep Creek Area, east of the USFS East Fork Campground, T14S, R9W section 1. (Map 12 Appendix A).

BLM would designate as open to motorized use, .17 miles of primitive road that is a cut across from East Fork Little Sheep Creek road to the route, which goes past the USFS East Fork Campground. This is a commonly used route already. BLM would also close to all motorized use .25 miles of route that is currently designated as open but is not listed that way on the interagency travel maps. The route that would be closed is to the southeast of the newly opened route and would be closed at their intersection. There is no spot to turn around further down this route so this is the most logical location to close it to all motorized use.

Henneberry House / Ney Ranch Recreation Site in T9S R10W Section 2 (No Map)

The road into the recreation cabin rental has areas where there needs to be revegetation of sage brush and grass and physical barriers in order to delineate the road and prevent vehicles from driving off-road and to the edge of the Beaverhead River. In addition, the road requires annual maintenance in the form of mechanical mowing 50 feet on both sides to help prevent snow drifts that can impede access to the property. Any mechanical mowing

would avoid cultural features associated with the Site 24BE2099 and sensitive plants, if identified. Mowing would not occur during waterfowl and migratory bird nesting season between April 15th and August 1st.

Additionally the BLM would do the following:

- Work with mobile media mapping companies to correctly identify and label open routes, and to either not show closed routes or to label them as closed to motorized vehicles.
- Install hiker and horse-accessible gates at key locations to allow horseback travel while restricting motorized travel on routes closed to motorize use.
- Install an informational kiosk at key access locations.
- Obliterate or reclaim user-created routes by scarifying the route surface and planting live vegetation and/or placing dead brush within the linear disturbance to obscure the visual presence of the route from the adjoining route junction.

The recommended changes to travel management are shown on Map (6,7,8,9,10,12,13 in Appendix A). These changes would result in no net gain or loss of designated open routes within the watershed. Most of the changes are the result of a change in designated open routes to correct mapping errors.

TABLE 2.7: SUMMARY OF TRAVEL MANAGEMENT CHANGES; ALTERNATIVE B

Travel Management (Designated Route changes, in miles)			
	Common to All Action Alternatives	Alternative B	Alternative C
Net change in designated open motorized routes	N/A	Add 0.2 miles of designated route	N/A

Alternative C

Livestock Grazing

Under alternative C only livestock management changes for the Snowline AMP allotment are proposed, and shown in Table 2.8.

TABLE 2.8: ALTERNATIVE C (LIVESTOCK GRAZING MANAGEMENT AND PROPOSED PROJECTS)

Table 2.8: Alternative C (Livestock Grazing Management and Proposed Projects)

- **Snowline AMP, 30029 (I)**

Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	1032 Cattle	6/6-10/21	42	Active	1966
	20 Horses (Field 2 Truax Only)	10/1-4/1	19%	Custodial	23
Changes	23 Cattle AUM's would be converted to dormant season horse AUM's in the Field 2 A only. Also, 1.5-2 miles of fence would be constructed to divide the Pine Butte Pasture into an east and west unit. Livestock would be scheduled in the Pine Butte Pasture at the same time as Alternative A, however all of the livestock would be confined to each of the Pine Butte pastures for approximately ½ of the scheduled time, allowing for shorter grazing periods and increased use of the uplands.				
Specified Grazing System	Rest Rotation				

Grazing Rotation/Terms

Number Livestock	**Pasture**	**Year 1**	**Year 2**	**Year 3**
650 Cattle	Field 6	6/17-7/30	9/10-10/20	Rest
	Field 8	9/11-10/20	6/17-9/9	7/22-10/20
	Field 9	8/1-9/10	Rest	6/17-7/21
700 Cattle	South Dutch Hollow	Rest	6/21-7/21	9/26-10/17
	North West Dutch Hollow and Field A2 and A3	6/21-7/11	8/28-9/17	Rest
	North East Dutch Hollow and Field 4A	7/12-8/2	Rest	6/21-7/12
675 Cattle	Pine Butte East	9/3-9/27	Rest	6/6-6/30
	Pine Butte West	9/28-10/21	Rest	7/1-7/22

- Until pasture layout is modified the 700 cattle herd would follow the rotation outlined under Alternative A.
- Riparian Multiple Indicator Monitoring (MIM) Station will be established in reach 945. Baseline data will be gathered during rest year after 7/1. Indicators monitored will be Green Line to Green Line width, stream bank stability and cover, and greenline Composition. If significant improvements are not observed after two full cycles of this new plan, authorized use within the Pine Butte Pasture would be reduced by 25% based on current permitting. The duration would not exceed 36 Days within the entire unit and would be rotated through the east pine butte and

Table 2.8: Alternative C (Livestock Grazing Management and Proposed Projects)	
	west pine butte pastures (675 Cattle would be authorized to graze 9/3-10/21 year 1, rest year 2, 6/6-7/22 Year 3). Additionally 112 AUM's would be placed into suspended non-use.
Projects	• All projects proposed under Alternative B for the Snowline AMP allotment would be carried forward. • Install 1.5 – 2 miles of fence dividing Pine Butte Pasture

Non-Commercial Mechanical/Prescribed Fire

Up to 1,913 acres of treatments identified in Alternative C include all units from Alternative B plus the addition of the Limekiln 3 unit. Treatment methods for this alternative would be a combination of cutting (lop and scatter), mastication, and/or prescribed fire. Actual prescribed fire treatment boundaries within the units identified on Map 3, Appendix A, would be based on topographic features such as ridges and drainages, and man-made features such as trails and roads. Treatments would occur in early spring or late fall to ensure existing fuels are readily available to support fire spread. Proposed treatments in Alternative C are summarized in the table below.

TABLE 2.9:NON-COMMERCIAL MECHANICAL/PRESCRIBED FIRE UNITS, ALTERNATIVE C

Unit Name	Allotment	Acres	Objective(s)	Treatment Type(s)
Eastfork	Clark Canyon	110	Reduce conifer expansion into sagebrush/grassland	Non-commercial mechanical/Broadcast Rx fire
Eastfork 2	Clark Canyon	696		
Bell Face	Roe West	380		
Limekiln 3	Bell Canyon/Roe West	727		

Alternative D

Livestock Grazing

Under Alternative D only changes to the Snowline AMP allotment are proposed, and shown in table 2.10.

TABLE 2.10: ALTERNATIVE D –LIVESTOCK GRAZING MANAGEMENT

Table 2.10: Alternative D –Livestock Grazing Management

- **Snowline AMP, 30029 (I)**

Mandatory Terms and Conditions	**# and Kind**	**Season of use**	**% PL**	**Type Use**	**AUM's**
	891 Cattle	6/6-10/21	39	Active	1577
	20 Horses (Field 2 Truax Only)	10/1-4/1	19%	C	23
Changes	Livestock use in the Pine Butte Pasture would not be authorized. 388 AUM's would be placed into suspended non-use. Total number of livestock authorized would be reduced. No change to management on the other pastures.				
Specified Grazing System	Rest Rotation				

Grazing Rotation/Terms

Number Livestock	**Pasture**	**Year 1**	**Year 2**	**Year 3**
650 Cattle	Field 6	6/17-7/30	9/10-10/20	Rest
	Field 8	9/11-10/20	6/17-9/9	7/22-10/20
	Field 9	8/1-9/10	Rest	6/17-7/21
700 Cattle	South Dutch Hollow	Rest	6/21-7/21	9/26-10/17
	North Dutch Hollow and Field A2 and A3	6/21-7/26	8/28-10/8	Rest
	Little Lease (private) and Field A4	7/27-8/17	Rest	6/21-7/12
0 Cattle	Pine Butte	Rest	Rest	Rest

- Not to exceed 10 days in field 4 A
- Not to exceed 21 days in the north Dutch hollow pasture

Comparison of Alternatives

TABLE 2.11: COMPARISON OF LIVESTOCK MANAGEMENT ALTERNATIVES

Allotment: Cedar Creek, Shoshone Cove, Williams

Alternative A

Mandatory Terms	Allotment	# and Kind	Season	%PL	Type	AUM's
	Cedar Cr.	176 Cattle	5/9-6/30	100	Active	307
	Shoshone Cove	195 Cattle		50		170
	Williams	136 Cattle		97		230

Grazing System: Growing Season Use/ Rest Rotation

Rotation/ Other Terms:

Year	Williams	Shoshone Cove	Cedar Creek
1	May 9-June 5	June 6-June 30	Rest
2	June 6-June 30	Rest	May 9-June 5
3	Rest	May 9-June 5	June 6-June 30

- All three allotments (Cedar Creek, Shoshone Cove, Williams) will be grazed with up to 250 cow/calf under a three treatment (early spring, late spring, rest) grazing schedule for up to 53 days annually.

Projects: N/A

Alternative B

Mandatory Terms	Allotment	# and Kind	Season	%PL	Type	AUM's
	Cedar Cr.	62	11/1-3/30	100	Active	307
	Shoshone Cove	69		50		170
	Williams	48		97		230

Grazing System: Dormant Season Use/Rest Rotation

Rotation/ Other Terms:

Year	Williams	Shoshone Cove	Cedar Creek
1	Graze	Graze	Rest
2	Graze	Rest	Graze
3	Rest	Graze	Graze

- Each allotment shall be rested once every three years
- Number of livestock may vary within the authorized season of use as long as the total AUM's authorized in each allotment are not exceeded.
- If fall/winter weather conditions preclude livestock grazing on the scheduled allotments, BLM may authorize the permittee to graze livestock from 4/1-4/30
  - This authorization shall not permit April grazing on the same pasture in consecutive years.
  - This flexibility will not be granted more than 3 times over the course of the 10 year permit
- If it is deemed that due to environmental conditions this season of use is not compatible with the livestock operation, the permit would be re-issued for the previous season of use and management (Alternative A) for the remainder of the permit term.

Projects:
- Authorize temporary water haul site for permanent use
- Implement up to 1,250 acres of rangeland seeding on the Williams, Roe West, and Bell Canyon Allotments.

Allotment: Clark Canyon

Alternative A

Mandatory Terms	# and Kind	Season	%PL	Type	AUM's
	400 Cattle	5/15-10/15	50	Custodial	935

Grazing System: Rest Rotation/ Annual Deferred Use

Rotation/ Other Terms:

Year	West McMenomy	Middle McMenomy	Dry Gulch	East McMenomy	Horse Creek	State Buck
1	Graze	Graze	Graze	Rest	Rest	Rest
2	Rest	Rest	Rest	Graze	Graze	Rest
3	Rest	Graze	Graze	Rest	Rest	Graze
4	Graze	Rest	Rest	Rest	Graze	Graze
5	Rest	Graze	Rest	Graze	Rest	Graze
6	Graze	Rest	Graze	Rest	Rest	Graze
7	Rest	Rest	Rest	Graze	Graze	Rest
8	Rest	Graze	Graze	Rest	Rest	Graze

Alternative B

Mandatory Terms	# and Kind	Season	%PL	Type	AUM's
	400 Cattle	5/15-10/15	50	Custodial	917

Grazing System: Rest Rotation/Annual Deferred Use

Rotation/ Other Terms: Use would follow Alternative A's rotation, however State/Buck Pasture would be removed from allotment following re-alignment of the boundary fence with the Dry Gulch Pasture. 18 AUM's of preference would be removed from Clark Canyon Allotment. State Buck Pasture would have an Authorization of 2 Cattle 3/1-2/28 100%PL 18 AUM's

<table>
<tr><td></td><td>
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<tr><td>Year</td><td>West McMenomy</td><td>Middle McMenomy</td><td>Dry Gulch</td><td>East McMenomy</td><td>Horse Creek</td><td>State Buck</td></tr>
<tr><td>9</td><td>Graze</td><td>Rest</td><td>Rest</td><td>Rest</td><td>Graze</td><td>Rest</td></tr>
<tr><td>10</td><td>Rest</td><td>Rest</td><td>Rest</td><td>Rest</td><td>Graze</td><td>Rest</td></tr>
<tr><td colspan="7">Graze = Grazing may occur in pasture from May 15– July 7, Rest = no grazing during the grazing year</td></tr>
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<table>
<tr><td>Year</td><td>Horse Mountain</td><td>Clark Canyon #2</td><td>Clark Canyon #3</td><td>Clark Canyon #4</td><td>Clark Canyon #1</td></tr>
<tr><td>1</td><td>7/8- 7/30</td><td>7/31-8/29</td><td>8/30-9/14</td><td>9/15-10/1</td><td>10/2-10/15</td></tr>
<tr><td>2</td><td>10/2- 10/15</td><td>9/15-10/1</td><td>8/30-9/14</td><td>7/31-8/29</td><td>7/8-7/30</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>Projects</td><td>N/A</td><td>Projects</td><td>• Re-align fence between State/Buck Pasture and Dry Gulch Pasture. Net Increase of 1,200 feet of new fence.</td></tr>
<tr><td colspan="4">Allotment: Gallagher</td></tr>
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<tr><td># and Kind</td><td>Season</td><td>%PL</td><td>Type</td><td>AUM’s</td></tr>
<tr><td>140 Cattle</td><td>6/1-10/7</td><td>90</td><td>Active</td><td>534</td></tr>
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<tr><td># and Kind</td><td>Season</td><td>%PL</td><td>Type</td><td>AUM’s</td></tr>
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<tr><td>Rotation/ Other Terms</td><td>
<table>
<tr><td>Year</td><td>Lower Bill Hill</td><td>Upper Bill Hill</td><td>North Gallagher</td><td>South Gallagher</td><td>Gravel Pit</td><td>Beacon Hill</td><td>Meadow</td></tr>
<tr><td>1</td><td>Rest</td><td>8/10-9/10</td><td>7/6-8/9</td><td>6/1-7/5</td><td>9/11-9/17</td><td>9/18-9/30</td><td>10/1-10/7</td></tr>
<tr><td>2</td><td>6/1-7/5</td><td>Rest</td><td>8/10-9/10</td><td>7/6-8/9</td><td>9/11-9/17</td><td>9/18-9/30</td><td>10/1-10/7</td></tr>
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<tr><td>4</td><td>8/10-9/10</td><td>7/6-8/9</td><td>6/1-7/5</td><td>Rest</td><td>9/11-9/17</td><td>9/18-9/30</td><td>10/1-10/7</td></tr>
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<tr><td>1</td><td>Rest</td><td>8/10-9/7</td><td>7/6-8/9</td><td>6/1-7/5</td><td>9/8-9/17</td><td>9/18-9/30</td><td>10/1-10/7</td></tr>
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<tr><td>3</td><td>6/30-8/9</td><td>6/1-6/29</td><td>Rest</td><td>8/10-9/9</td><td>Rest</td><td>9/10-9/32</td><td>9/24-10/1</td></tr>
<tr><td>4</td><td>8/5-9/8</td><td>7/7-8/4</td><td>6/1-7/6</td><td>Rest</td><td>9/9-9/18</td><td>9/19-9/30</td><td>10/1-10/7</td></tr>
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• Grazing use in the Upper Bill Hill Pasture shall not exceed 29 days per year regardless of stock density.
</td></tr>
<tr><td>Projects</td><td>N/A</td><td>Projects</td><td>• Install ½ mile of pipeline and 1 stock water trough off of Bill Hill Spring (477205)
• Install collections box, pipeline and tank from Gallagher Creek to North Gallagher Pasture (0.9 miles)</td></tr>
<tr><td colspan="4">Allotment: Gallagher Mountain AMP</td></tr>
<tr><td colspan="2">Alternative A</td><td colspan="2">Alternative B</td></tr>
<tr><td>Mandatory Terms</td><td>
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<tr><td>1200 Cattle</td><td>5/1-11/20</td><td>100</td><td>Custodial</td><td>3,231</td></tr>
<tr><td>15 Horse</td><td>12/1-5/15</td><td>45</td><td>Active</td><td>37</td></tr>
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<tr><td># and Kind</td><td>Season</td><td>%PL</td><td>Type</td><td>AUM’s</td></tr>
<tr><td>995 Cattle</td><td>5/15-11/20</td><td>52%</td><td>Active</td><td>3,235</td></tr>
<tr><td>15 Horse</td><td>12/1-5/15</td><td>45%</td><td>Active</td><td>37</td></tr>
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<tr><td>Grazing System</td><td>Rest Rotation/ Annual Deferred Use</td><td>Grazing System</td><td>Rest Rotation/ Annual Deferred Use</td></tr>
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<tr><td>Plan</td><td colspan="2">2 Pasture Rest Rotation</td><td colspan="3">3 Pasture Rest Rotation</td><td>Annual Use</td></tr>
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<tr><td></td><td colspan="2">Rest every other year</td><td colspan="6">Rest every fourth year</td></tr>
<tr><td>2019</td><td>Rest</td><td>10/15-11/20</td><td>Rest</td><td></td><td>8/15-9/1
10/1-10/15</td><td></td><td>5/15-7/15</td><td>7/15-8/15</td></tr>
<tr><td>2020</td><td>10/15-11/20</td><td>Rest</td><td>5/15-6/15</td><td>10/1-10/30</td><td>6/15-7/7</td><td>7/7-8/1</td><td>8/1-9/1</td><td>Rest</td></tr>
<tr><td>2021</td><td>Rest</td><td>5/15-6/15</td><td>10/15-11/20</td><td>6/15-7/15</td><td>Rest</td><td>Rest</td><td>7/15-8/15</td><td>8/15-9/1
10/1-10/15</td></tr>
<tr><td>2022</td><td>5/15-6/15</td><td>Rest</td><td>6/15-7/15</td><td>Rest</td><td>10/24-11/20</td><td>10/1-10/24</td><td>Rest</td><td>7/15-9/1</td></tr>
<tr><td>2023</td><td>Rest</td><td>10/15-11/20</td><td>Rest</td><td>5/15-6/7</td><td>10/1-10/30</td><td>6/7-6/21</td><td>6/21-8/1</td><td>8/1-9/1</td></tr>
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									Year	**Warm Spring**	**Dry Mast**	**East Lovell**	**West Lovell**	**Gallagher North**	**Gallagher South**	**Henneberry**	**Clark Canyon**
									2024	10/15-11/20	Rest	5/15-6/15	6/15-7/1 10/1-10/30	7/1-7/21	7/21-8/14	8/14-9/14	Rest
									2025	Rest	5/15-6/15	6/15-7/7	7/7-8/10	Rest	Rest	8/10-9/1 10/30-11/20	10/1-10/30
									2026	5/15-6/15	Rest	10/1-11/20	Rest	6/15-7/7	8/7-9/1	Rest	7/7-8/7
									2027	Rest	11/20-11/20	Rest	10/1-10/20	8/7-9/1	7/15-8/7	5/15-6/15	6/15-7/15
									2028	11/1-11/20	Rest	5/15-6/15	6/15-7/15	10/14-11/1	10/1-10/14	7/15-9/1	Rest
									• Summer grazing plan would generally follow the rotation listed above: Grazing plan may be modified on an annual basis to deal with environmental conditions, water conditions, etc. with the following requirements: ○ Grazing use does not occur during the same period in consecutive years in any pasture ○ Every pasture will be rested from grazing once out of every four years. (I.E. grazed three years, rested the fourth year). Warm Spring and Dry Mast will continue to be rested every other year. ○ Growing season grazing (5/15-9/1) shall be limited to not more than 45 days in any one pasture, and should be generally 30 days or less. ○ Hot season grazing 6/15-9/1 shall be limited to approximately 3 weeks or less in the north and south Gallagher pastures.							
Projects	N/A								**Projects**	• Install Pipeline and up to three stock tanks from Gallagher Creek to Lovell's Pasture ~1.3 miles would be installed on BLM • Split Lovell's and Gallagher Pastures with electric fence (~3.25 miles combined on BLM) • Construct Exclosure (<1 acre) around seep in Hennebery Pasture, with the potential for future development.							
Allotment: Norris Canyon																	
Alternative A									**Alternative B**								
Mandatory Terms	**# and Kind**	**Season**	**%PL**	**Type**	**AUM's**				**Mandatory Terms**	**# and Kind**	**Season**	**%PL**	**Type**	**AUM's**			
	450 Cattle	6/1-6/21	43	Custodial	72					450 Cattle	6/1-6/21	43%	Active	72			
		11/6-11/11		Active	38												
Grazing System	Deferred Rotation								**Grazing System**	Rest Rotation							
Rotation/ Other Terms	Year 1: 6/1-6/10, Year 2: 6/11-6/21, Year 3: 11/6-11/11								**Rotation/ Other Terms**	• Allotment will be grazed for not more than 10 days per season. • Allotment will be rested from grazing one in four years							
Projects	**N/A**								**Projects**	None							

Allotment: Snowline AMP

Alternative A

	# and Kind	Season	%PL	Type	AUM's
Mandatory Terms	1044 Cattle	6/6-10/21	42	Active	1989

Grazing System: Rest Rotation

Rotation/ Other Terms

Number Livestock	Pasture	Year 1	Year 2	Year 3
650 Cattle	Field 6	6/17-7/30	9/10-10/20	Rest
	Field 8	9/11-10/20	6/17-9/9	7/22-10/20
	Field 9	8/1-9/10	Rest	6/17-7/21
700 Cattle	South Dutch Hollow	Rest	6/21-7/21	9/26-10/17
	North Dutch Hollow and Field A2 and A3	6/21-7/26	8/28-10/8	Rest
	Little Lease (private) and Field A4	7/27-8/17* not to exceed 10 days in A4	Rest	6/21-7/12
675 Cattle	Pine Butte	9/3-10/21	Rest	6/6-7/22

- Not to exceed 10 days in field 4 A
- Not to exceed 21 days in the north Dutch hollow pasture

Projects: N/A

Alternative B

	# and Kind	Season	%PL	Type	AUM's
Mandatory Terms	961 Cattle	6/6-10/31	42%	Active	1966
	20 Horses (Field 2A Truax)	10/1-4/1	19%	Custodial	23

Grazing System: Rest Rotation

Rotation/ Other Terms

Number Livestock	Pasture	Year 1	Year 2	Year 3
650 Cattle	Field 6	6/17-7/30	9/10-10/20	Rest
	Field 8	9/11-10/20	6/17-9/9	7/22-10/20
	Field 9	8/1-9/10	Rest	6/17-7/21
700 Cattle	South Dutch Hollow	Rest	6/21-7/21	9/26-10/17
	North West Dutch Hollow and Field A2 and A3	6/21-7/11	8/28-9/17	Rest
	North East Dutch Hollow and Field 4A	7/12-8/2	Rest	6/21-7/12
Up To 1065 Cattle	Pine Butte	10/1-10/31	Rest	6/1-6/14 and 10/7-10/31

- Until pasture layout is modified the 700 cattle herd would follow the rotation outlined under Alternative A.
- Grazing use on Pine Butte Pasture year three is intended to be a twice over grazing plan. Harvesting all of the AUM's during the spring period is not authorized, however AUM's may be deferred until the fall use period. No more than 14 days of grazing are authorized in June
- Riparian Multiple Indicator Monitoring (MIM) Station will be established in reach 945. Baseline data will be gathered during rest year after 7/1. Indicators monitored will be Green Line to Green Line width, stream bank stability and cover, and greenline Composition. If significant improvements are not observed after two full cycles of this new plan, authorized use within the Pine Butte Pasture would be reduced by 25% based on current permitting. The duration would not exceed 36 Days (675 Cattle would be authorized to graze 6/1-7/7 year 1, rest year 2, 9/15-10/21 Year 3).Additionally 112 AUM's would be placed into suspended non-use

Projects

- Develop and exclude spring 947
- Fence Reach 941 with water gaps (~.7 Miles)
- Authorized a well in Dutch Hollow North Pasture
- Remove ~1.5 miles of net wire fence in the North Dutch Hollow/Field A Pastures
- Install ~1.4 miles of standard 3 wire fence in the North Dutch Hollow pasture
- Modify .45 miles of standard fence to let down fence between the Snowline and Lima Peaks allotments
- Develop water system from the head of reach 945 to a stock tank (~0.5 miles)
- Add ~0.5 miles of new pipeline from the existing pipeline in Pine Butte Pasture if water production increases.
- If water production does not increase, develop water system from the head of reach 904 to a stock tank (~1.1 miles)
- Increase storage or the number of tanks at two watering locations in Pine Butte Pasture.

Alternative C

	# and Kind	Season	%PL	Type	AUM's
Mandatory Terms	1032 Cattle	6/6-10/21	42%	Active	1966
	20 Horse	10/1-4/1	19%	Custodial	23

Grazing System: Rest Rotation

Rotation/ Other Terms:

Number Livestock	Pasture	Year 1	Year 2	Year 3
650 Cattle	Field 6	6/17-7/30	9/10-10/20	Rest
	Field 8	9/11-10/20	6/17-9/9	7/22-10/20
	Field 9	8/1-9/10	Rest	6/17-7/21
700 Cattle	South Dutch Hollow	Rest	6/21-7/21	9/26-10/17
	North West Dutch Hollow and Field A2 and A3	6/21-7/11	8/28-9/17	Rest
	North East Dutch Hollow and Field 4A	7/12-8/2	Rest	6/21-7/12
675 Cattle	Pine Butte East	9/3-9/27	Rest	6/6-6/30
	Pine Butte West	9/28-10/21	Rest	7/1-7/22

- Until pasture layout is modified the 700 cattle herd would follow the rotation outlined under Alternative A.
- Riparian Multiple Indicator Monitoring (MIM) Station will be established in reach 945. Baseline data will be gathered during rest year after 7/1. Indicators monitored will be Green Line to Green Line width, stream bank stability and cover, and greenline Composition. If significant improvements are not observed after two full cycles of this new plan, authorized use within the Pine Butte Pasture would be reduced by 25% based on current permitting. The duration would not exceed 36 Days within the entire unit and would be rotated through the east pine butte and west pine butte pastures (675 Cattle would be authorized to graze 6/1-7/7 year 1, rest year 2, 9/15-10/21 Year 3).Additionally 112 AUM's would be placed into suspended non-use

Projects:
- All Projects under Alternative B would be carried forward
- Install ~1.5-2 miles of fence to split Pine Butte Pasture

Alternative D

	# and Kind	Season	%PL	Type	AUM's
Mandatory Terms	891 Cattle	6/6-10/21	39%	Active	1,577
	20 Horse	10/1-4/1	19%	Custodial	23

Grazing System: Complete Rest on Pine Butte Pasture. Rest Rotation on all remaining pastures. 388 AUM's would be placed into suspended non-use.

Rotation/ Other Terms:

Number Livestock	Pasture	Year 1	Year 2	Year 3
650 Cattle	Field 6	6/17-7/30	9/10-10/20	Rest
	Field 8	9/11-10/20	6/17-9/9	7/22-10/20
	Field 9	8/1-9/10	Rest	6/17-7/21
700 Cattle	South Dutch Hollow	Rest	6/21-7/21	9/26-10/17
	North Dutch Hollow and Field A2 and A3	6/21-7/26	8/28-10/8	Rest
	Little Lease (private) and Field A4	7/27-8/17	Rest	6/21-7/12
0 Cattle	Pine Butte	Rest	Rest	Rest

- Not to exceed 10 days in field 4 A
- Not to exceed 21 days in the north Dutch hollow pasture

Projects: N/A

TABLE 2.12: COMPARISON OF ALTERNATIVES BY PROGRAM (NOT INCLUDING LIVESTOCK GRAZING)

Table 2.12: Comparison of Alternatives by Program (not including livestock grazing)				
Range Improvement Projects by Alternative				
Project	**Alternative A**	**Alternative B**	**Alternative C**	**Alternative D**
New Fence Installed (Miles)	No projects are proposed Under Alt. A.	6.3	3.6	No projects are proposed Under Alt. D.
Existing Fence Removed (Miles)		2.25	1.25	
New Pipeline (Miles)		5.2-6.3	2.4	
Permanent Stock Water Troughs		13	5	
Livestock Water Wells		1	1	
Seeding acres		1,563	0	
Non-Commercial Mechanical/ Prescribe Fire Projects				
Number of Units	No projects are proposed under Alt. A.	3	4	No projects are proposed Under Alt. D.
Maximum acres treated		1,186	1,913	
Commercial Forest Treatments				
Number of Units	No commercial forest treatments are proposed under Alt. A.	8	Not commercial forest treatments are proposed under Alt. C.	Not commercial forest treatments are proposed under Alt. D.
Maximum Acres		1,188 Acres		
Maximum Miles of Temporary Road		7.25		
Estimated Number of Stream Crossings		9		
Riparian Vegetation Treatments				
Riparian Conifer Expansion				
Number of Reaches	No Riparian Conifer Expansion Treatments are proposed under Alt. A.	13	No Riparian Conifer Expansion Treatments are proposed under Alt. C.	No Riparian Conifer Expansion Treatments are proposed under Alt. D.
[1.] **Number of Miles/Acres**		7.25 miles / 0.75 Acres		

Table 2.12: Comparison of Alternatives by Program (not including livestock grazing)				
Willow Regeneration				
Number of Treatment Units/Acres	No Willow Treatments are proposed under Alt. A.	1 / 330 Acres	No Willow Treatments are proposed under Alt. C.	No Willow Treatments are proposed under Alt. D.
[2.]Travel Management				
Number of new Routes Designated Open	No travel management designations are proposed under Alt. A.	7.2	No travel management designations are proposed under Alt. C.	No travel management designations are proposed under Alt. D.
Number of New Routes Designated Closed		7		
Net Change in Miles of Routes		Add. 0.2 miles of designated route		

1. Number of acres only reflects the number of acres associated with lentic riparian systems only. Most treatments would be conducted in lotic systems which are summarized by linear miles rather than acres.
2. No new routes/roads would be created. All routes/roads designated as "new" are existing on the landscape and would be designated as open to accommodate safer travel, existing high use, and to reduce resource damage from motorized use on poorly constructed/located routes. Small connecting routes located near road/route intersections are not included in this summary.

Chapter 3 AFFECTED ENVIRONMENT

Introduction

This chapter describes the existing condition of specific environmental components that may be affected by the proposed action. The description of the affected environment is related to the specific issue and resource concerns identified in Chapter 1, but also encompasses the wider landscape of the RRLW. This chapter is a summary of the baseline environment. A more detailed and comprehensive description of the current conditions in the watershed is provided in the RRLW Assessment Report (December 2017) and is available for review at the Dillon Field Office or online at ePlanning.

General Setting

The RRLW is located in southern Beaverhead County, Montana. The RRLW follows the I-15 corridor from the Barrett's exit south of Dillon, Montana south to the Montana/Idaho border near Monida, Montana. Within the RRLW there are approximately 338,027 acres. Of these acres, 69,730 acres are BLM managed public land. This represents approximately 21 percent of the watershed. This report addresses only the public lands administered by the BLM. There are also 80,948 acres (24% of the watershed) administered by the United States Forest Service (USFS), 9,500 acres (3% of the watershed) administered by the Bureau of Reclamation (BOR), 53,451 acres (16% of the watershed) administered by the Montana Department of Natural Resources and Conservation (DNRC), and 124,394 acres (37% of the watershed) of privately own lands within the RRLW.

Elevations on BLM administered public land within the RRLW range from approximately 5,300 feet along the Beaverhead River at the north end of the watershed, to over 9,200 feet near the communications tower on Mauer Mountain, east of Clark Canyon Reservoir. Common with foothill/mountainous areas, the topography varies greatly. Flat to gently sloping uplands are commonly found along the Red Rock River valley. These areas typically receive 11-14 inches of precipitation annually. A majority of these lands are either privately owned or administered by the DNRC, however portions of the Clark Canyon, Williams, Roe West, Bell Canyon, North McKnight, and Norris Canyon allotments contain public lands on these flat to gently sloping rangelands. Foothills and mountain slopes are common within the RRLW and are found between the valley floors and alpine mountaintops. The foothills and mountain slopes typically receive between 12-16 inches of precipitation annually. Typically these landforms are administered either the BLM or the USFS, however significant tracts of private property occur within the foothills/mountain slopes areas within the RRLW. The mountain tops and alpine areas are primarily managed by either the BLM or USFS within the RRLW. Precipitation in these areas can range from 16-22 inches annually.

Given the spatial scale of the watershed (approximately 49 miles north to south) and the wide elevation gradient, soils and ecological sites vary greatly throughout the RRLW. Most soils on BLM were formed from alluvium, colluvium, slide deposits, and slope alluvium. These soils range in depth from rock outcrop, or no soil development, to very deep, and most have a loam dominated texture class.

Given the many variables across the RRWL, ecological sites are also diverse. Ecological sites are defined as a kind of land with specific physical characteristics which differs from other kinds of land in its ability to produce distinctive kinds and amounts of vegetation and in its response to management. Characteristics such as soil depth and texture, landform and aspect, slope, and precipitation all influence a sites ability to produce vegetation and respond to management, therefore creating unique ecological sites. Typically low lying BLM administered rangeland soils within the RRLW are influenced by increasing amounts of carbonate, and are typically referred to as a type of limey phased site. As precipitation increases, typically these carbonates leach out of the surface layers of the soil. In these areas, silty to silty steep ecological sites are commonly found on BLM managed lands within the RRLW.

Vegetation across the watershed varies as ecological sites, precipitation, slope, aspect, and the chemical properties of the soil change. These variations provide the unique conditions for multiple vegetative communities to exist, often times in very close proximity to one another, while requiring entirely different site conditions to persist. Grass and shrublands cover most of the BLM managed public land, however these areas are broken up by forested habitats that typically occur at mid to high elevations, and primarily on north aspects. Riparian habitats are also interspersed in these grasslands and shrublands, and typically occur as a narrow stringer of habitat, sometimes crossing the landscape for miles. These multiple vegetative communities provide habitat for a host of wildlife species.

Relevant Past and Ongoing Actions:

Throughout the watershed there are numerous past and currently ongoing actions that are affecting resource conditions and land uses within the RRLW. Past issues/actions affecting or continuing to affect resource conditions today include historic livestock grazing, land treatments, wildfire and fire suppression, logging, mining, roads and travel management, and special management designations.

As discussed in detail in the RRLW Assessment Report (December 2017) early livestock grazing (late 1800's-early 1900's) was centered around low input systems. During this period rangeland and riparian resources were used extensively with little regard for their condition or sustainability. Continuous livestock grazing was a common practice due to convenience as well as lack of fencing and developed water. As a result, rangelands near natural surface water, and near historic towns were heavily used by a host of livestock. This continuous use often resulted in severely degraded vegetative conditions, that in some cases modified the sites physical characteristics (uplands losing topsoil, streams becoming entrenched), and overall functional capability. Therefore, some areas within the RRLW have an altered functional potential, or are very slow to recover from this historic use. A specific example of this can be observed south of Clark Canyon Reservoir, near the historic town of Armstead (now flooded under Clark Canyon Reservoir). Continuous grazing by the town and ranch livestock along the toe of the Tendoy Mountains (Williams allotment south to the South Flats pasture of Bell Canyon) likely altered the plant community. The vegetative community has generally lost the most palatable and productive grass species expected on these rangelands. These species have been replaced by shorter statured grasses, which are more grazing resistant. In addition, lime concentrations are naturally high throughout this area, which reduce the sites ecologic potential and ability to recover from disturbance. Managed livestock grazing continues on these rangelands as well as

most throughout the RRLW. None of the authorizations issued by BLM allow continuous grazing on public lands.

In the 1960's and 1970's land treatments were implemented by the BLM to control (reduce) sagebrush and stimulate grass production. Within the watershed nine treatments occurred during this period. Treatment areas are shown on Maps 3 and 4 in Appendix A. Within these treatment areas AIM points 1,3,6,7, and 11 are located. Additionally HAF plots 10 and 11 are also located within these treatment areas. The data collected at these seven plots show that shrub canopy cover ranges from 5-48% with an average of 30.7% shrub cover. Perennial grass cover on these sites ranges from 42-74% with an average of 53%. These data indicate that treated areas have recovered following the treatments, and now contain suitable to even elevated canopies of shrubs. These data support the IDT's review of these treatment areas across the RRLW.

Since the last RRLW Watershed Assessment Environmental Analysis there has been one wildfire according to the BLM's National Fire Perimeter Data set. This fire, the Maurer Mountain Wildfire in 2017, burned approximately 2,700 acres within the Clark Canyon and Roe allotments. In response to this wildfire, livestock grazing would not be authorized in BLM managed burned areas for two growing seasons. Additionally, herbicide, cheatgrass control treatments, and native plant seeding projects are currently being implemented on portions of the burn to ensure proper vegetative recovery in areas presumed to be infested by annual grasses. There was an additional fire not in BLM's National Fire Perimeter Data set. This fire burned along the Beaverhead River on reach 2. The fire was approximately 20 acres.

Fire suppression continues to be implemented on federally-administered lands throughout the watershed based on current fire management plans and relative values to be protected commensurate with fire management costs. The long term benefits of wildfire would be considered on a case-by-case basis, however heavy fire suppression within the watershed is expected for a variety of reasons. With continued fire suppression, conifer expansion into montane sagebrush steppe habitat is expected to continue (see RRLW Assessment Report, pg. 67). As stated in Hyerdahl et al. (2006), "in the continued absence of fire, mountain big sagebrush and grasslands in southwest Montana are likely to become more homogenous as Douglas-fir trees continue to encroach." Without any natural or human caused disturbances some areas currently occupied by sagebrush and scattered conifer seedlings would be converted to a forest cover type within approximately 30 years. The potential for wildfire ignitions on all ownerships will continue.

Logging has occurred throughout the watershed since early settlement. Evidence is present within the RRLW as noted from old stumps that were cut using a cross-cut saw in some places. The dates and extent of these actions are unknown. There are no recent logging activities.

In 2010, the DFO implemented about 1.9 miles of riparian juniper removal treatment along multiple drainages within the Gallagher and Clark Canyon Isolated allotments. Gallagher Creek reaches numbers 25, 26, 75, and 76 (note: 75 & 76 have been removed from stream inventory and are now tracked as riparian points) and reach 926 of Clark Canyon Creek were treated (reaches shown on Map 3). The primary objective of the treatments was to cut Rocky Mountain juniper that were competing with more desirable stabilizing deciduous riparian shrubs and sedges for limited resources (i.e. sunlight and water). By removing the shading effect of juniper within the riparian areas, willow, aspen, cottonwood, and sedges have sufficient resources available to recolonize the riparian areas. Also in 2010, a project to introduce large woody debris into Reach

900 of Bell Canyon was completed. The project consisted of recruiting large wood from on-site and place within the highly entrenched portions of the creek to enhance aggradation. Willow cuttings were also planted along the reach.

The Dillon Field Office completed their travel management planning with the 2006 Dillon RMP as amended. Since the RMP, the office has been correcting mapping issues as well as errors and revising travel management decisions through the watershed assessment and planning process.

During the last Red Rock Lima Watershed Assessment in 2007 there was one minor change to the travel management. The change closed roughly ½ mile of "jeep trail", and designated an open route of similar length in the vicinity, which provides access to the same area. The jeep trail was causing excessive resource damage.

The 2007 RRLW EA approved several projects in the Bell-Limekiln Canyon WSA. The conifer encroachment treatments consisted of non-commercial mechanical treatments and/or prescribed burns. There were six treatment areas, treating up to a 2,115 acres. Not all of these units were completed and some are being carried forward. There was an aerial spraying application to treat 200 acres of Cheatgrass infestation. There were four spring exclosures within the WSA, each with at least 300 feet of fencing the riparian reach on each side, the associated fencing totaled between ½ to 1 mile of new fence in the WSA.

Resources Brought Forward for Analysis

Resource Issue 1: Riparian, Wetland, and Aquatic Habitat

In Chapter 1 of this EA, the riparian, wetland and aquatic habitat objectives for the Red Rock-Lima Watershed were described. Per the 2006 Dillon RMP as amended, the goal is to initiate an upward trend in 20 years; the objective is to move resource conditions forward toward reaching Desired Future Conditions (DFC) in 20 to 50 years. Streams that are achieving Proper Functioning Condition (PFC) are not necessarily at DFC, however, PFC is a prerequisite to achieving desired condition (USDI, 2015b).

There are approximately 35 miles of stream inventoried on BLM in the RRLW, consisting of numerous smaller intermittent and perennial reaches in the higher elevations that feed the larger perennial streams down in the valley bottoms. Stream flow in the RRLW fluctuates annually and seasonally in response to precipitation in the form of rain and snow.

The majority of BLM administered land within the assessment area (67%) is south, or upstream, of Clark Canyon Reservoir therefore the majority of the assessment area falls within the *Red Rock* 4th level hydrologic unit (a.k.a. 8-digit Hydrologic Unit Code or HUC8). Within the Red Rock HUC8, the assessment area includes stream reaches that contribute to four different 5th level hydrologic units (a.k.a. HUC10) as follows: Little Sheep, Junction Creek, Red Rock River and Lower Horse Prairie Creek.

Though the majority of the assessment area falls into the Red Rock HUC8, the majority of stream miles are tributaries to the Beaverhead River downstream of Clark Canyon Reservoir (64% of stream miles) within the Beaverhead HUC8 (10020002). The BLM riparian habitat in this watershed runs off of the foothills of Blacktail Mountains and is comprised of portions of Clark Canyon Creek including its headwater tributaries, Gallagher Creek from above 6,500 feet

in elevation all the way to its confluence with the Beaverhead River near 5,300 feet, Bill Hill Creek, Lovells Gulch, and Little Basin Canyon.

Channel types vary through the assessment area but nearly 80% are classified as moderate gradient (2-4%, Rosgen type B or G) to high gradient (>4%, Rosgen type A) streams. By stream miles, the proportion of vegetative habitat types tips heavily to the deciduous woody habitat types of aspen, willow, and narrowleaf cottonwood at a combined 75% of the total miles. Variations of the herbaceous sedge habitat type are next with 14% of total stream miles followed by conifer habitat types (spruce, Douglas-Fir) at 10%, with the remaining portion made up of juniper.

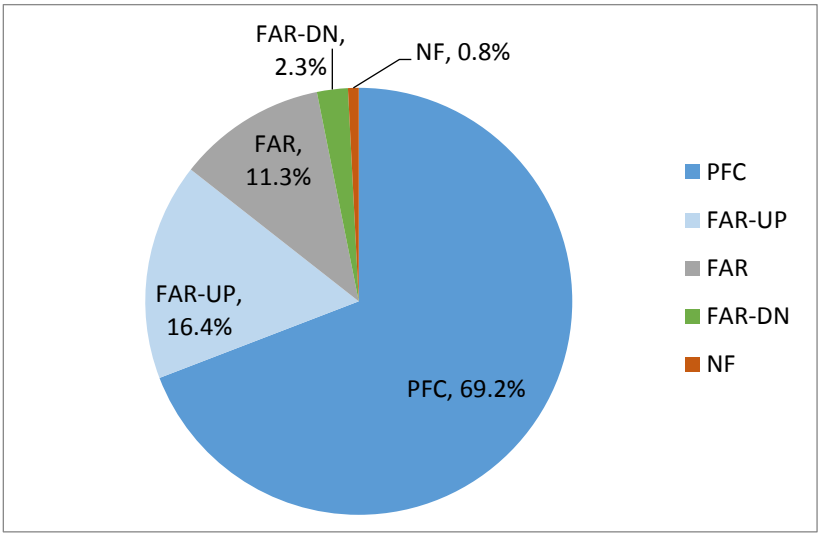
Riparian Functional Condition

Streams

Stream morphology (channel shape and dimensions, including width and depth, and gradient) and bed materials provide important information to determine a stream's function. Critical shear stress must be achieved before a stream channel is capable of reshaping and maintaining itself. If impact to a channel causes it to widen, shear stress or stream power is reduced and the channels ability to move bedload and sediment is diminished. As these reductions continue, sediments often accumulate which force the stream to widen even more (USDI, 2015b). If a channels vertical stability is compromised and a channel becomes entrenched, stream power is increased and size of material movable by the stream would increase. Both alterations in channel geometry would inhibit the ability of a stream to maintain riffles and pools at a natural rate or frequency. The BLM's regulation requires streams to have the ability to maintain stable dimensions, patterns and profiles.

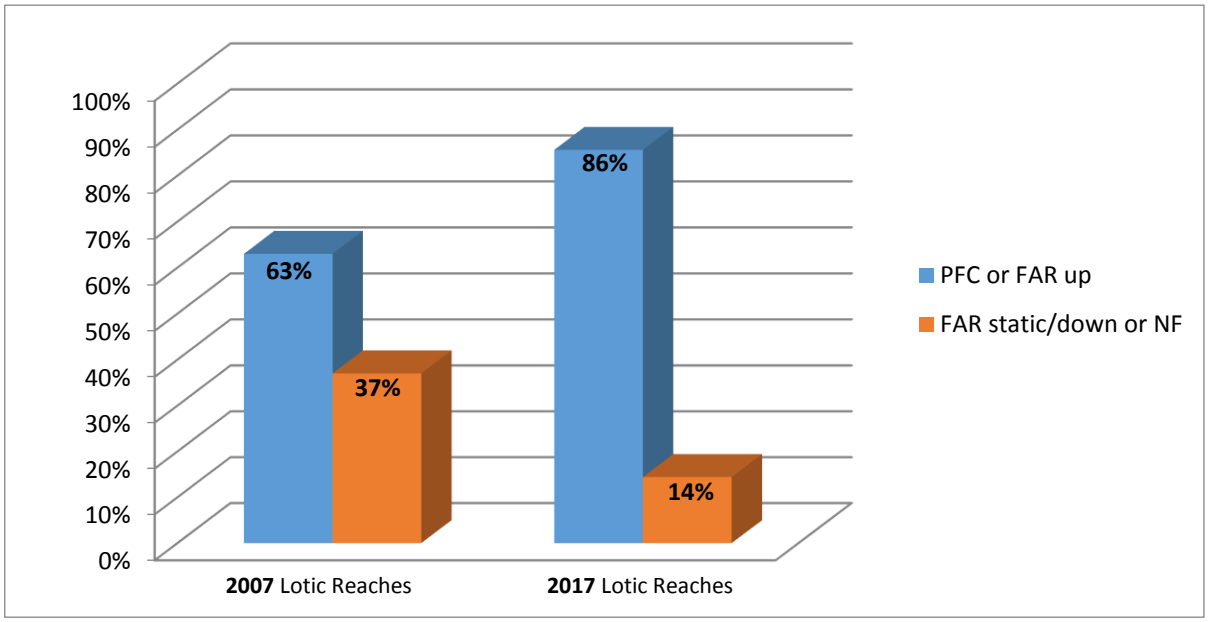
There are 49 riparian reaches inventoried for a total of about 35 miles within the RRLW that were assessed for functional condition. The breakdown for stream condition is shown in Figure 3.1.

FIGURE 3.1: 2017 RRLW LOTIC FUNCTIONAL RATING SUMMARY (MILES)



The locations and functional class ratings for streams in the RRLW are also shown in Appendix A , maps 3 and 4. The list of lotic reaches with their condition can be found in Table 2 of Appendix E. The percentage of the total lotic stream miles in each functional class as determined in 2017 versus the previous 2007 assessment is illustrated in Figure 3.2.

FIGURE 3.2: 2017 RRLW LOTIC FUNCTIONAL RATING 2007 VS 2017

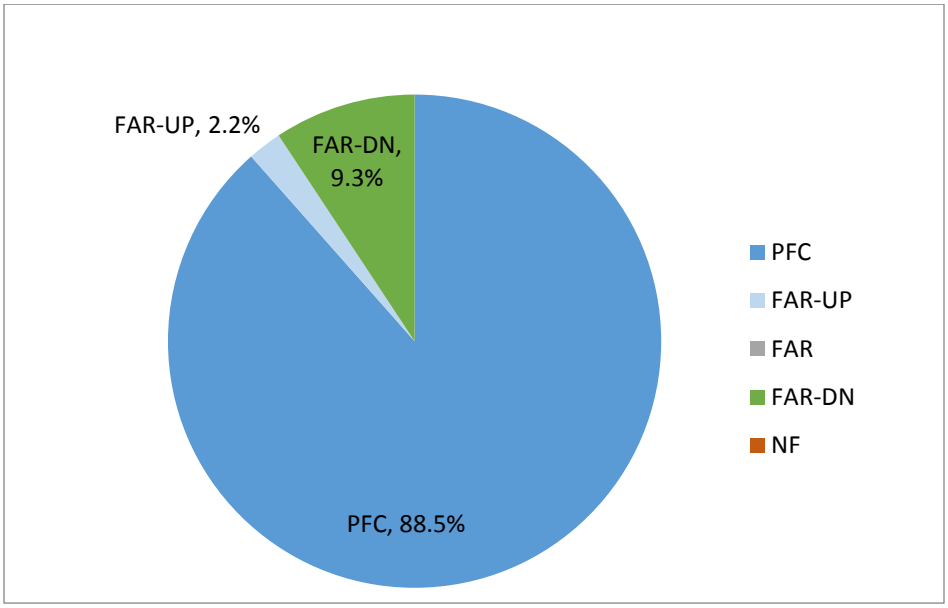


In general, where streams were not PFC, concerns included: alteration of stream morphology, reduced access to floodplains, down cutting, reduction in species diversity and composition, reduced vegetative cover, limited vegetative species recruitment and regeneration, reduced structural diversity, and/or decreased vigor of streamside vegetation. Generally, ungulate grazing and browsing, roads and road crossings, and juniper encroachment were the most frequently observed causal factors.

Wetlands

Eight lentic (wetland) reaches totaling about 398 acres were assessed in the RRLW. Approximately 330 acres is accounted for in one wetland complex along the Beaverhead River downstream of the Pipe Organ fishing access. Of the eight lentic reaches assessed, seven reaches, totaling roughly 362 acres or 90% of the total, were rated PFC or FAR-upward (Figure 3.3). A list of lentic reaches and their functional rating can be found in Appendix E Table 3. Maps 3 and 4 in Appendix A also display the lentic reaches with their functional rating.

FIGURE 3.3: 2017 RRLW LENTIC FUNCTIONAL RATING SUMMARY (ACRES)



The single lentic reach that rated FAR with a downward trend was previously inventoried as lotic complex but was reclassified as a wet meadow following this assessment. This reach will be discussed in more detail below with the Snowline AMP allotment.

Riparian Resource Concerns by Allotment

The allotments in which all the riparian resources rated as PFC or FAR with an upward trend are not discussed in this section, but information on these resources is available upon request. Additional stream reach specific data for any of the riparian areas in the RRLW is available at the Dillon Field Office.

Gallagher Mountain AMP

The majority of the riparian reaches in the Gallagher Mountain AMP allotment rated well with the exception of the Dry Mast pasture. Lovells Gulch, Reach #80, rated FAR-Static within the Dry Mast pasture. The channel is deeply incised throughout with numerous active headcuts, sections are over-widened due to hoof action, there is heavy trailing directly adjacent to the channel, juniper have started to encroach within the riparian, there are areas of bare soil and bare streambank, and there appears to be excessive sediment deposition within the channel. At its potential this channel would likely function as Rosgen B channel; at its current state it has taken on the geometry of a G channel with sections of F where the channel is over widened. There is a small culvert on the reach that is plugged and knapweed and houndstongue were also noted.

Gallagher

Within the Upper Bill Hill Pasture, Bill Hill Creek Reach #14 rated FAR-Static, the same rating it received in 2007. Greenline data supports a static trend over the last 10 years. The channel is relatively steep and therefore is naturally confined through much of the reach but there are areas where the drainage bottom opens up and there should be potential for high flows to spread out more than they do at its current state. Of the most concern is the road crossing at about the midpoint of the mapped reach. At the time of assessment there was no surface flow at the road crossing but the road effectively dams the drainage at high flows and an inappropriately placed

culvert sends flows into the uplands where active headcuts are moving up-valley towards the road.

Below the road crossing, from the southwest, an ephemeral drainage formerly mapped as a separate reach (#78) has now been joined with Reach #14. This ephemeral fork of #14 is valuable wet meadow/mesic habitat but contains numerous active headcuts that are working their way through the meadow effectively draining and reducing the available mesic habitat.

Ney Ranch Unallotted

Sandwiched within the Gallagher Allotment is riparian Reach #2, the Beaverhead River, and the large riverine wetland complex Reach #2401, also known as the Ney Ranch wetland. Though both reaches rated PFC during the assessment there is concern about the vigor and reproduction of riparian shrubs. Discharge of the Beaverhead River is controlled by Clark Canyon Reservoir therefore the floodplain is no longer active. There are currently large contiguous stands of decadent willow along abandoned meanders within Reach 2401 that can be attributed to the upstream flow regulation and a lack of disturbance by high water events.

Clark Canyon and Clark Canyon Isolated

Within Clark Canyon Isolated, Reach #926 rated FAR-Static because it is deeply entrenched with a very high width to depth ratio. Given its position on a relatively broad valley bottom and visible alluvium in its banks, this channel could function as a C channel with an active floodplain and well developed point bars. It is unclear how much this reach was directly manipulated in the past to accommodate irrigated hay fields on the terrace to the north, but it appears the channel is abnormally straight and locked in this position by large cobble that make up its banks. There is evidence of an inset floodplain trying to establish itself in sections of the reach but the stream does not seem to be able to breakdown the larger cobble in the outside banks to further its evolution. In addition there appears to be excessive mid-channel deposition in areas. A high sediment load is not out of the ordinary given the highly erosive characteristics of the Clark Canyon drainage but there are many upstream diversions that likely dampen transport capabilities. It is also possible that the upstream diversions reduce the streams ability to evolve by breaking down its banks and building a new inset floodplain. It appears this channel is locked into F and G channel types.

Upstream of #926, on the Clark Canyon allotment, Reach #949 rated FAR with a downward trend due to the lower half of the channel being converted to and maintained as a ditch to feed a head gate located on the reach. The straightening and resultant increase in velocities have caused the channel to downcut and disconnect itself from its former floodplain. As of the assessment the upper half of the reach would have rated well but it is at risk due to the downstream conditions. A four foot headcut stabilized by large woody debris now separates the downstream "ditch" and the upstream stream channel. Once this wood fails the headcut will move rapidly upstream and continue to degrade riparian habitat.

Lima Peaks

Within the Lima Peaks allotment Reach #913 rated as non-functional as the stream has been diverted and ditched away from its natural flow path. The natural channel is therefore not supporting the riparian community it could. Within the ditch the flow has also been diverted, there are numerous active headcuts and it is incised throughout.

Snowline AMP and Snowline AMP Custodial

Most riparian reaches within the Pine Butte pasture of the Snowline AMP allotment and custodial pastures adjacent to Pine Butte pasture were not meeting PFC or making progress towards it.

Reach #941 is located along the railroad right-of-way near the interstate. Undoubtedly the railroad and interstate have had some effect on this reaches alignment and overall function. Regardless, the channel at its current potential is not properly functioning due to excessive bank impact from hoof shear and over widening of the channel.

Reaches #945 and #993 are located just southeast of Pine Butte. They were previously inventoried as one contiguous reach, Reach #945, prior to the 2017 assessment. The reach was split at a change in channel type and #993 was created as the lower portion of this tributary. Throughout both reaches the channel was overwide, there were sloughing banks lacking vegetation, excessive sediment within the channel, and extensive hummocking within the riparian zone and in adjacent wet meadows. Willow recruitment is lacking a middle age class and young willow were heavily browsed at the time of assessment.

Previously, reach #904 was inventoried as a stream, but was currently inventoried in the lentic database as a wet meadow that contributes to reach #993 from the southeast. Reach #904 is the bottom of the drainage and includes one draw off the southwest slope of the drainage. Excessive trailing and hummocking have altered flow paths through the reach and is a concern throughout. There are multiple dysfunctional water developments placed in the bottom and old check dams that have failed and caused headcutting to occur upstream. Deciduous woody vegetation is severely hedged along #904, but aspen regeneration is good within the wooded draws to the southeast. Approximately 0.6 miles to the west of #904 is Snowline Spring #1 (inventoried as developed spring Reach #947). This spring was developed historically, but it is no longer functioning and the condition of the associated riparian habitat is similar to other riparian habitat in the area with livestock as the primary cause for its FAR condition.

Reach #946 is the East Fork of Beaver Creek. *Current management was not the causal factor for this reach rating FAR with a downward trend.* It appears that historically this riparian area was used as a corridor to trail livestock from one pasture to another. The topography of this area, the remnant fence lines that border either side of the riparian reach, and the condition of the riparian habitat all indicate this corridor as a likely place that heavy repeated trailing occurred. The channel here is severely incised through fine grained material with large blocks of bank breaking off into the channel. Though it is deeply incised, there are still active headcuts threatening to downcut further throughout the BLM managed land and immediately downstream of the BLM boundary. Prior to historic trailing this riparian reach likely functioned as a wet meadow that experienced the majority of its surface flow as sheet flow during snowmelt. There may have been a shallow swale that conveyed flow but nothing indicates the 3-5 foot deep by 2-3 foot wide channel is a stable state for this system. Trailing captured and concentrated flow which increased flow velocities and caused this channel to downcut. The degradation of the mainstem of Beaver Creek through the confluence of the two channels has also likely attributed to the degradation as the East Fork appears to still be adjusting vertically (i.e. active headcuts) to meet the new, lower, elevation of the mainstem.

Developed Springs

Spring ecosystems include aquatic and riparian habitat similar to those of lotic or lentic systems. Springs are replenished by precipitation that percolates into aquifers then discharges at the ground surface. Surface discharge can be gravity fed or have an artesian source based on the location and regional or local geology (USDI, 2001). Springs that are typically candidates for development within the Dillon Field Office provide a small pocket (less than one tenth of an acre) of wetland/riparian habitat at their source then if discharge is adequate, flow concentrates in a relatively confined channel and runs down gradient. Often, surface flow terminates and riparian characteristics along flow paths diminish before reaching any receiving body of water. The distance that surface flow travels can and will vary depending on the amount of discharge at the source, the time of year, and amount of precipitation received within the contributing area. Riparian vegetation, vertebrate, and non-vertebrate communities differ between the spring source and habitats provided downstream as water chemistry, temperature, and flow vary temporally and spatially as water moves through the system (USDI, 2001).

There are 27 spring developments on BLM managed public land within the RRLW. BLM staff visited most of these developments to determine resource condition, condition of infrastructure, and water production (flow). Table 4 of Appendix E lists the spring developments on BLM administered land in the watershed.

Maintenance of water developments was a noted concern on a handful of developments in the watershed. Maintenance problems primarily included dysfunctional pipelines and structural maintenance needs for the exclosure or need for a new exclosure. These maintenance issues can negatively impact wetland hydrology and do not help attain the objective(s) that the development was originally intended to achieve (i.e., livestock distribution or mitigation of impacts to perennial streams).

Aquatic Habitat

Within the Red Rock Assessment area, there are three streams and one river which support cold water fisheries. Most streams within the assessment area receive little fishing pressure. The exception is the Beaverhead River, which is a popular sport fishery, providing around 48,681 angler use days of fishing (MFWP 2013).

Native fish found within the Red Rock watershed include mountain whitefish, white, longnose and mountain sucker and mottled sculpin. Non-native rainbow, brown and brook trout were introduced, likely about the turn of the century and are found in area streams.

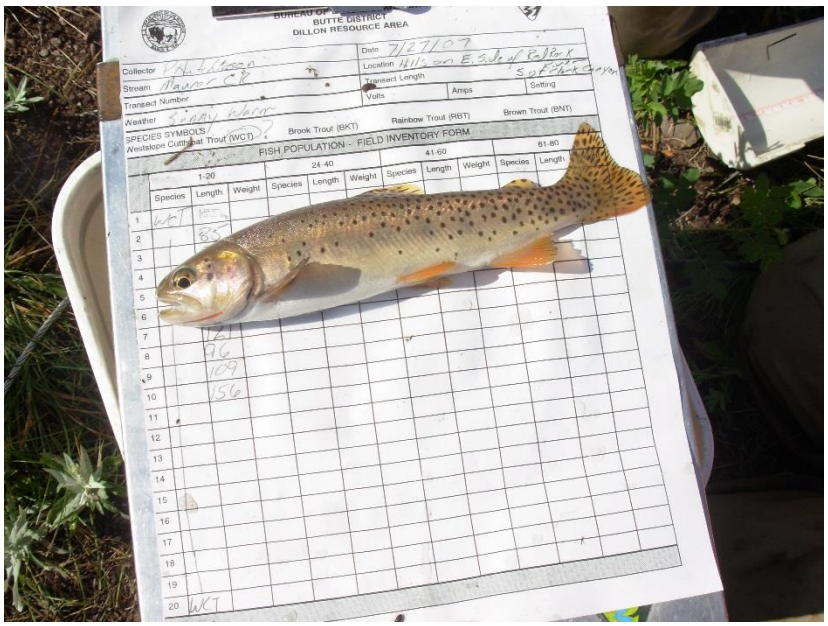
Fishery habitat conditions on streams within the RRLW are generally in good condition. Streams have been surveyed over the last 10 years to address data gaps in past fishery related surveys. These include evaluating potential west slope cutthroat trout populations for genetic purity, assessing suitability for westslope cutthroat trout (WCT) restoration and monitoring general fishery habitat conditions.

TABLE 3.1: FISHERIES STREAMS AND FISH SPECIES PRESENT ON BLM

Stream	Stream Reach	Fish Species Present on BLM	BLM Stream Miles
Little Sheep	915	Brook trout, mottled sculpin, rainbow x cutthroat hybrids,	0.18
East Fork Little Sheep	914	Brook trout, mottled sculpin, rainbow x cutthroat hybrids,	1.68
Maurer	983	Cutthroat hybrids	0.28
Beaverhead River	2	Brown trout, rainbow trout, white sucker, longnose sucker, mottled sculpin, mountain whitefish	2.55

Fisheries and Aquatic

Maurer Creek



Maurer Creek supports a population of hybridized trout of unknown genetic origin. Fish surveys conducted on this stream in 2007 and 2017 indicate a relatively robust population of hybrid cutthroat trout in the drainage. Trout numbers were found to be ~ 8.6 per 100 feet of stream. Habitat conditions on the short BLM reach were found to be fair to good. Stream banks supported a diversity of riparian vegetation dominated by woody species such as willow and river birch. Sedges and herbaceous species were present at low levels. Spawning gravels were noted throughout the reach. The elevated sediment levels originating from the open route adjacent to the stream are likely having some impact on pool quality/quantity.

Little Sheep Creek

This drainage supports a population of eastern brook trout and hybridized cutthroat trout as well as native species such as mottled sculpin. In 2008 an electrofishing survey was conducted within the BLM reach. Brook trout and mottled sculpin were the only species collected.

East Fork Little Sheep Creek

The East Fork of Little Sheep Creek supports populations of eastern brook trout and hybridized cutthroat trout. This stream was surveyed for westslope cutthroat trout in 2008. Brook trout were found in the lower and middle portions of the drainage. Sculpin and hybrid cutthroat showing a strong rainbow appearance were found at low abundance in the lowest reaches. No westslope cutthroat trout were found.

Clark Canyon Creek

Clark Canyon Creek was identified as needing a fishery survey to determine fish species presence and distribution within the drainage during the 2007 Red Rock Lima Watershed Assessment. In August 2008, the drainage was surveyed. Surveys conducted at that time indicated this drainage does not support a fishery. One Rainbow trout and one mottled sculpin were collected in the lowest reaches of the drainage approximately 300 yards above the confluence with the Beaverhead River. Surveys were conducted throughout the drainage from approximately 300 yards above the confluence with the Beaverhead River to the headwaters. No other fish were collected within the drainage. The uplands within the drainage are prone to slumping events within the headwaters. The high sediment loads resulting from these periodic events is likely the limiting factor preventing long term fish occupation.

Using baselines identified in the "Beaverhead Sediment Total Maximum Daily Loads and Framework Water Quality Protection Plan" (Montana DEQ. 2012), streams < 15 foot wetted width would be expected to have a minimum of ≥ 90 pools per stream mile while streams 15-30 feet bankfull width would be expected to have ≥ 52. Residual pool depth would be expected to be approximately 10 inches and % fines (<6mm) would be expected to be between 10% and 30% depending on stream gradient and channel type. Steeper gradient "B" channels would be expected to have slightly more or less than 10% fines < 6mm while lower gradient "E" type channels are expected to have up to 30% fines < 6mm. Stream size and gradient will affect pool number, residual depth and the percentage of fine sediment present. Generally, as stream size decreases pool frequency increases and pool depth decreases. Using the data in Table 3.2 below, both surveyed streams are on the low end of the natural range of variability for expected pool frequency based on stream size. Both streams exhibit slightly elevated sediment levels which likely inhibit pool frequency and quality. However, both surveyed streams have an open road directly adjacent to the stream which is likely the primary source of a large percentage of the excess sediment. Spawning habitat was present throughout both BLM administered reaches. The sediment levels within the Little Sheep reach are likely high enough to inhibit spawning within the surveyed reach.

TABLE 3.2: RRLW POOL FREQUENCY, DEPTH, AND % FINES

Stream	Primary Channel	Average Stream Width (feet)	Pool Frequency (per mile)	Residual Pool Depth (inches)	% Fines (<6mm)	2017 watershed Riparian Rating
Little Sheep Creek	C	9	88	11.2	33	PFC
Mauer Creek	B	3	123	6.4	20	PFC

Throughout the west, the threat of increasing water temperatures on fisheries habitat due to climate change is a growing concern. Studies have linked water temperature with lower cutthroat performance in water temperatures >59F (DeStatso and Rahel 1994; Dunham et al. 1999; Novinger 2000). Water temperature monitoring within the assessment area was initiated in 2013 to track potential changes in summer stream temperatures. Data collected to date shows that both average and summer peak temperatures have remained relatively consistent since

temperature monitoring began (see Table 3.3 below). Average summer stream temperatures to date indicate that the area streams are within cold water fish tolerances. Peak temperatures observed were generally for short periods of time and temperatures dropped back into preferred ranges rather quickly.

TABLE 3.3: RRLW STREAM TEMPERATURE DATA

Stream/Year	Year	Avg. temperature 6/1-9/1	Peak temperature 6/1-9/1
Little Sheep Creek	2013	53.7	64.9
Little Sheep Creek	2014	52.6	62.9
Little Sheep Cree	2015	53	60.7
Little Sheep Creek	2016	51.4	58.3
Little Sheep Creek	2017	51.4	58.2
Average		52.4	61
Mauer Creek	2017	48	58
Clark Canyon Creek	2017	54	67.7

Invasive Aquatic Species

There are no known populations of aquatic invasive species found within the Red Rock/Lima Watershed.

Resource Issue 2: Upland Sagebrush and Grassland Habitat

Sagebrush and grassland habitat on BLM managed land accounts for approximately 84% (58,235 acres) of the BLM managed habitat within the RRLW, and approximately 17% of the total habitat within RRLW. There are approximately six times as many shrubland acres (49,881 acres) as there are grassland acres (8,354 acres) on BLM managed public lands within the RRLW.

Shrublands are typically composed of an overstory of big sagebrush (*Artemisia tridentata*) over a herbaceous community of cool season mid to short height bunchgrasses, most commonly including: bluebunch wheatgrass (*Pseudoroegneria spicatum*), Idaho fescue (*Festuca idahoensis*), prairie junegrass (*Koeleria macrantha*), Sandberg bluegrass (*Poa sandbergii*), and needle and thread (*Hesperostipa comata*). Additionally a diverse component of forbs are generally present. Southern portions of the watershed have an increased composition of three tip sagebrush *(Artemisia tripartita)* and a decreasing composition of big sagebrush, as the valley floor raises toward the continental divide. Grassland habitats typically have a similar graminoid component without the shrub cover.

Within any individual upland grassland or shrubland community throughout the watershed, these species are generally present; however, their relative proportion may be more or less within the community depending on a variety of factors such as past disturbance, current management, precipitation, as well as others. Additionally, each community has a component of native

increaser/invader species, which are typically present in all stages of a community, however when disturbance or environmental stressors increase, these species also tend to increase. Examples of native increaser/invader species are broom snakeweed (*Guteirrezia sarothrae*), rabbitbrush (*Chrysothamnus spp*.), horsebrush (*Tetradymia spp*), and blue grama (*Bouteloua gracilis)*. Each of these species has an adaptation that allows them to maintain a highly competitive advantage while other species may be stressed due to ongoing management actions, or environmental factors such a drought. For example, broom snakeweed is a short perennial shrub, which can become toxic to grazing livestock, therefore livestock tend to utilize other forage resources. When these forage resources become stressed due to drought, grazing, or a combination of factors, the broom snakeweed remains relatively stress free and can then capitalize on the newly available resources within the community as other species may be declining. Over time these increaser/invader species will increase given the opportunity.

Additionally, some level of periodic disturbance is necessary to maintain high quality rangelands, and to restore vegetative communities towards a more productive state. For example, within a big sagebrush/bluebunch wheatgrass community, big sagebrush will continue to increase under most management systems. As the proportion of sagebrush increases, herbaceous species will generally decline, as the big sagebrush occupies more space and utilizes more available resources. Often times some type of disturbance (fire, insect/disease, etc.) is needed to control the long lived sagebrush, and to allow the herbaceous component to recover.

If a plant community has a shift away from the expected plant community toward an increaser dominated community, it may be a reflection of current or past management, or a combination of these factors in conjunction with environmental factors. Even if a community has a decrease of desirable plants, the community may continue to meet upland health standards, if the current community can support the necessary biological functions, or attributes of the healthy rangeland. The expected conditions are indicated on published ecological site descriptions and reference sheets, or range site descriptions by ecological site or range site. For example if a community is shifting toward an increaser/invader community, but the current community is providing adequate soil cover and protection to allow for infiltration of water and minimizing erosion, the area may continue to meet the BLM's upland health standard.

In 2017, The BLM conducted 34 Rangeland Health Assessments (RHA's) on BLM administered public lands throughout the RRLW. All of these sites met the upland health standard, with attribute ratings of "Slight to Moderate" departure or less from expected conditions for the attributes of rangeland health. The biotic integrity attribute was rated as "Slight to Moderate" departure on 14 RHA's. This was more than the other two attributes; Soil and Site stability (7 "Slight to Moderate" ratings) and Hydrologic Function (9 "Slight to Moderate" ratings).

Within the Biotic attribute rating is the vegetative functional structural group indicator. Vegetative functional structural groups are a suite of species that are grouped together on an ecological site basis, because of similar shoot or root structure, photosynthetic pathways, life cycle, etc. Specifically, 15 of the 34 RHA's (44%) rated the vegetative functional structural groups attribute as slight to moderate departure. All but one of these sites received this rating due to an increase in shrub cover. Of the sites with increased shrubs, there was a resultant decrease in expected production on 11 of the sites.

This tendency of increasing departure in the vegetative community functional/structural groups is also supported by the long-term trend studies, Assessment, Inventory, and Monitor (AIM) data

and Habitat Assessment Framework (HAF) data collected in the watershed. Of the 17 AIM plots completed within the watershed on shrublands, six (35%) of them had sagebrush canopy cover over 25%. HAF data collected within the watershed found that 10 of the 13 plots (77%) had sagebrush canopy cover over 25%. Twenty-five percent sagebrush canopy cover is the upper limit of the objective for suitable sage grouse habitat as referenced in the 2015 Sage Grouse Habitat Assessment Framework, as well as the Idaho and Southwestern Montana Greater Sage-Grouse Approved RMP Amendment (ARMPA) (USDI, 2015). The allotments where RHA's rated the vegetative functional structural groups as departed due to increased shrub cover include: Bell Canyon, Allotment E, Norris Canyon, Roe West, Snowline, Straight Creek Non AMP, and Pinetop Hill. The departure of this indicator across large areas of the watershed is likely due to a host of factors such as past livestock management, current livestock management, natural succession, as well as interrupted fire return frequency. While this indicator was slightly to moderately departed from the historic climax plant community in these allotments, the allotments did meet the upland health standards, which encompasses 16 other indicators of rangeland health.

Similar to increasing shrub cover, and directly tied to vegetative functional structural groups is conifer encroachment into shrublands.

As is the case across all landscapes, the upland plant composition in the RRLW is dynamic as the result of ecological succession. The natural progression from early seral stage plant communities towards a climax plant community is inevitable without disturbance. Conifer expansion (Rocky Mountain juniper and Douglas-fir) within sagebrush steppe habitat can be further defined by specific woodland succession phases. These three phases documented by Miller et al 2007, are represented in the table below. The phases are easily correlated to departure discussed in the context of fire regime condition classes (see Red Rock Lima Watershed Assessment Report p. 66-70), and associated exclusion of wildfire on the landscape with resulting higher fuel loads. Successional phases II & III are prevalent in localized areas of the RRLW.

TABLE 3.4: WOODLAND SUCCESSION PHASES

Phase	Description
Phase I- Sub-dominate	Trees are present but shrubs and herbs are the dominant vegetation that influence ecological processes (hydrologic, nutrient and energy cycles) on the site.
Phase II - co-dominate	Trees are codominant with shrubs and herbs and all three vegetation layers influence ecological processes on the site.
Phase III - dominate	Trees are the dominant vegetation and the primary plant layer influencing ecological processes on the site.

There are no other large scale functional departure tendencies known exist to grassland and shrubland communities within the RRLW. However several site specific issues were documented during the assessment report where authorized uses may need to be closely monitored, and potentially altered, or vegetative treatments may be warranted to ensure that grasslands and shrublands continue to be healthy. A brief summary of these site specific departures by allotment are listed below:

Allotment E: The RHA conducted on Allotment E found slight to moderate departure of the biotic integrity attribute. On this allotment, a livestock salt ground has been placed near (within

50 yards) of the permanent Daubenmire trend study. This study point shows a general shift in species composition toward and "increaser" dominated community. It was noted by the IDT that vegetative conditions improved as distance away from the salt ground increased. These conditions are consistent with other areas where livestock concentrate.

Williams, Roe West, Bell Canyon: Throughout each of these allotments, high carbonate (lime) concentrations (indicated by strong to violent effervescence found within the surface horizons of soil pits) occur in the soils throughout low lying gentle terrain of the valley floor. Areas of high lime concentrations within the surface horizons are known to have a reduced ecological potential and are much slower to respond to improved vegetative management practices. As a result of the lime concentrations, topography, and historic grazing practices, species diversity is limited. These rangelands are primarily dominated by needle-and-thread, and most of the RHA's conducted on these sites were rated at slight to moderate departure for the biotic attribute.

Norris Canyon: During the assessment, bull bovine were found on the Norris Canyon allotment outside of the authorized season of use. The bulls were concentrated on private land located on lower ground than the BLM managed public land near the only water source in the allotment. Additionally, high amounts of elk fecal pellets were noted during the assessment on the BLM managed public land. The RHA conducted on this allotment rated the biotic attribute as slight to moderate departure, due in part to the composition and vigor of the perennial vegetation.

Snowline AMP, Snowline Custodial: During the assessment, the IDT documented the effects of an unauthorized chemical application on sagebrush. It appeared that the chemical application had occurred 1-3 years prior to the assessment. The extent of the application on public lands was not accurately mapped during the assessment, but estimated to be approximately 25 acres in size. The unauthorized treatment was located in the Pine Butte Pasture of the Snowline AMP allotment and the Snowline Custodial allotment adjacent to private land, with varying degrees of mortality on the sagebrush.

Resource Issue 3: Forest and Woodland Habitat

Forest and woodland habitats comprise approximately 10% of BLM administered lands and 14% across all ownerships within the RRLW. The close association of forests with adjoining sagebrush and riparian habitats supports a broad array of wildlife species. This habitat provides important thermal and hiding cover, including security habitat for big game. Forest and woodland habitat, especially aspen and mountain mahogany, offers high protein browse species in the fall and winter, as well as year-round browse for moose and mule deer. Forests in the RRLW provide habitat for several species including mountain lions, dusky grouse, ruffed grouse, northern goshawk, and black bear. Forest-dwelling bird species utilize nesting and foraging habitat. Bird species such as the hairy and black-backed woodpeckers help protect forests by eating millions of damaging insects, such as the mountain pine beetle and western spruce budworm.

Within the watershed, there are four distinct areas that contain the majority of forested lands on BLM administered lands: Clark Canyon, East Fork of Little Sheep Creek, Dutch Hollow and Bell Canyon in the Tendoy Mountains.

The dominant tree species in this area are Douglas-fir (*Pseudotsuga menziesii)*, Engelmann spruce (*Picea engelmannii)*, limber pine (*pinus flexilis)*, Rocky Mountain juniper (*Juniperus*

scopulorum), quaking aspen (*Populus tremuloides)* and whitebark pine *(Pinus albicaulis).* Mountain mahogany (*Cercocarpus montanus)* is also found within the RRLW. The following information on each of the forest ecological systems is from the Montana Field Guide from the Montana Natural Heritage Program.

Douglas-fir Forest and Woodland is the dominate forest type in the RRLW. A generalist, the Douglas-fir is associated with a dry to submesic climate which has an annual precipitation range of 20-40 inches, and ranges in elevation from 6,500 to 7,500 feet. The fire return interval ranges from 20-45 years, although can be as infrequent as 500 years, leaving some very old trees in places. This tree species is mainly found on the lower treeline above sagebrush steppe, and is usually associated with gravelly soils on mountain slopes and benches (Montana Field Guide from the Montana Natural Heritage Program). Douglas-fir habitat types provide excellent hiding and thermal cover for deer and elk. It also provides nesting and/or roosting habitat for numerous bird species including great-horned owls, sharp-shinned hawks, great gray owls, and northern goshawks.

Although a native insect, the western spruce budworm *(Choristoneura occidentalis)* appears to have reached epidemic levels in many of the stands across the RRLW. Budworm populations are usually maintained at endemic levels by a suite of natural factors including: vertebrate and invertebrate predators, insect parasites, and adverse weather conditions, specifically cool summers (Fellin and Dewey 1986). The combination of favorable forest conditions and climatic conditions result in increased budworm activity, and typically the outbreak is more severe in dense stands (Hadley and Veblen 1993). The freshly hatched larvae of the budworm feed mostly on the needles of the new foliage, but also feed on the flowers and cones that are just developing. The repeated attacks and defoliation of the host tree year after year weakens the tree, eventually killing it from the top down (Fellin and Dewey 1982). The prolonged effect of the budworm is that it can change the overall stand structure by decreasing cone production, creating ideal conditions for subsequent bark beetle attacks in larger diameter trees, and creates potentially higher mortality rates for the defoliated understory trees (Hadley and Veblen 1993). This budworm has affected both the Douglas-fir and Engelmann spruce within RRLW.

Additionally, the native Douglas-fir bark beetle (*Dendroctonus pseudotsugae)* is also found within the forested stands in RRLW. Typically Douglas-fir beetle outbreaks occur in conjunction with weakening of host trees by a number of different agents including fire, drought, or insect defoliation, and often target larger diameter trees which have thicker phloem, cambium and outer sapwood which the insects prefer (Hadley and Veblen 1993). The highest mortality rates from a bark beetle outbreak would most likely occur in even aged stands with large diameter trees weakened from a prior agent. Douglas-fir bark beetle populations appear to be at endemic levels within some of the forested areas in RRLW.

Englemann spruce also have a large presence in the RRLW, and are associated with mesic to wet microsites, with elevation ranges from 5,200-8,800 feet. They are typically found in locations with cool and moist environments, like north facing slopes and cold-air drainages. Fire return intervals are often longer with the spruce-fir forest and woodlands, ranging between 170-300 years. They are susceptible to insect outbreaks, and the shallow root system makes them susceptible to blowdown (Montana Field Guide from the Montana Natural Heritage Program). Engelmann spruce, unlike other tree species, can grow steadily without decline for 300 years, and dominant spruce often range between 250-450 years old (USDA, NRCS 2017).

The aspen forest and woodland is a small but vital part of the RRLW as aspen stands are host to high biodiversity on the landscape. The distribution of aspen is dictated by the amount of precipitation it receives which ranges from 15-20 inches, or in places that hold moisture for a longer duration of time like north-facing slopes, swales or under large snow drifts, and they prefer deep well developed soils that are not rocky. Aspen stands regenerate after large disturbances such as disease outbreaks, logging activities, or fires, which have a return interval that ranges from 30-165 years. Aspen most often regenerates by sprouting which comes from the root system of the existing clone, but can regenerate from seed as well. Regionally aspen stands have experienced a decline, which is largely attributed to fire suppression and excessive ungulate browse. Aspen is also susceptible to insect and disease, one of which is the Cytospora canker which is caused by various species of the fungus *Cytospora* (Montana Field Guide from the Montana Natural Heritage Program). Aspen stands in RRLW overall are in a fair condition and the extent of the stands is declining. There are several factors contributing to the overall stand health: lack of disturbance, browse from elk, and advancement of conifer species. Without periodic disturbance on the landscape, the forest succession advances, allowing the short lived aspen species to decline and the conifer species to progress and take hold among the aspen (Rogers, 2002). Disturbance resets the seral stage of the landscape allowing new grasses, forbs and the shade intolerant aspen trees to thrive. Aspen is an important browse species for ungulates including deer, elk, and moose. Browse levels in many locations are high, and ungulate species such as deer and elk have heavily browsed a high percentage of young aspen sprouts. Aspen also provides hiding cover, summer shade and some thermal cover for ungulates in the winter, as well as hiding and thermal cover for many small mammals. Aspen also provides nesting and foraging habitat for a variety of bird species including dusky grouse, ruffed grouse, dark-eyed junco, house wren, chipping sparrow, and pine siskin. Aspen buds, flowers, and seeds are palatable to many bird species.

Limber Pine and Juniper Woodlands make up a smaller component of this watershed. These two tree species are often found in the same ecological system ranging in elevation from 4,000-7,500 feet and often higher in southwest Montana. Typically, these species grow on calcareous or limestone substrates, with rocky soils, and are usually found below the continuous forests of Douglas-fir and lodgepole pine. These two species thrive with very small amounts of precipitation, and are well adapted to rocky locations that can have harsh winters and summers of drought. The typical fire return interval ranges from 40-400 years. Neither of these species are well adapted for fire, and are easily killed by fire due to their thin bark. Limber pine is susceptible to the non-native white pine blister rust (*cronartium ribicola),* mountain pine beetle (*Dendroctonus ponderosae),* and in southwestern Montana pine dwarf-mistletoe (*Arceuthobium cyanocarpum).* The Clark's nutcracker is the primary seed disperser for limber pine. Limber pine seeds provide critical food for rodents and birds, including squirrels and Clark's nutcrackers, which also cache the seeds for later use. Other birds, small mammals, and bears benefit from these caches. Limber pine has been shown recently to have shifted on the landscape, both upslope and downslope (Means, 2010). Rocky Mountain juniper, on the other hand, is fairly resistant to most insects and diseases, is shallow rooted, and commonly grows in southwest Montana in a savanna-like manner (Montana Field Guide from the Montana Natural Heritage Program).

Whitebark pine (*Pinus Albicaulis)* is typically found on treelines and krummholtz habitats and is usually associated with subalpine forests. There is a small component of whitebark pine in the

RRLW. In southwestern Montana, whitebark pine are usually found at higher elevations ranging from 8,100-8,800 feet, but have been found locally at lower elevations. Whitebark is listed as a sensitive species due to the threat from the non-native white pine blister rust and the mountain pine beetle epidemic. The cones and seeds of whitebark are a primary food source for several wildlife species due to their high caloric and fat content. Seed dispersal is done almost entirely by the Clark's nutcracker, a bird that caches the seeds which will eventually germinate, if not found again by the Clark's nutcracker, bears, rodents or other birds. Whitebark pine has been recognized as a keystone species of high elevation habitats. They are important resources for wildlife food, snowpack retention, and watershed protection.

A healthy forest requires adequate sunlight, water, and nutrients, which are dependent on having enough space for each tree to acquire these basic needs. The reverse is that an overcrowded forest is less ideal and can increase the susceptibility of insect infestations and diseases and the potential for higher severity wildfires. The forests of the RRLW are experiencing moderate to high levels of insect activity. Native insects are vital components of a healthy ecosystem: they help to regulate forest diversity and density, are agents of disturbance and nutrient cycling, and are important components of the food chain. Forest health should not be considered solely on insect epidemics, but a big picture approach should be used in assessing forest health by looking at stand densities, tree species and age class diversities, fuel loading, and insect and pathogens present.

Resource Concern #1: Special Status Species and Big Game Habitat

The assessment area provides seasonal and yearlong habitat for a wide variety of sagebrush dependent species and other wildlife uses that are enhanced by the interspersion and diversity of sagebrush species, grasslands, riparian habitat, rocky outcrops and forested areas. BLM administered land in the RRLW has roughly 19,291 acres (28%) in sage grouse priority habitat management areas (PHMA) and 36,772 acres (53%) in sage grouse general habitat management areas (GHMA) (see Maps 2 and 3). Sagebrush comprises nearly 100% of sage grouse winter diets and provides thermal, hiding, and nesting cover. Nesting usually occurs within two miles of the lek, where suitable habitat is available. Brood rearing habitats require a mix of forbs and insects for a high protein diet, usually in association with riparian habitats. The watershed provides year-round sage grouse habitat, with most public land habitat in the Snowline and Henneberry Ridge areas. There are two sage grouse leks within one mile of each other near Henneberry Ridge and one lek near Snowline. Counts of male sage grouse attendance at these leks have been relatively stable over nearly two decades.

The Sage-Grouse Habitat Assessment Framework (HAF) (Stiver et al., 2015) and Idaho and Southwestern Montana Greater Sage-Grouse Approved RMP Amendment (ARMPA) (USDI, 2015) are BLM's guidance for sage grouse habitat. "Suitable" nesting/early brood-rearing habitat objectives include >80% of nesting habitat meeting these vegetation characteristics where appropriate (relative to ecological site potential, etc.): 15-25% sagebrush cover, 30-80 cm sagebrush height, ≥10% perennial grass cover, ≥18 cm perennial grass and forb height, and ≥5% perennial forb cover. "Suitable" late brood-rearing/summer habitat objectives include >40% of summer/brood habitat meeting these recommended brood habitat characteristics where appropriate (relative to ecological site potential, etc.): 10-25% sagebrush cover, 40-80 cm sagebrush height, and >15% perennial grass and forb cover.

HAF plot data gathered between mid-June and mid-July, 2017 found that shrub cover ranged from 0-48%, and 77% of habitat plots had shrub cover >25%. Shrub height ranged from 0-74 cm, and 77% of plots had shrub height between 30-80 cm. Perennial grass cover ranged from 36-83%, and 100% of plots had ≥10% perennial grass cover. Perennial grass height ranged from 11-40 cm, with over 92% of plots ≥18 cm. Perennial forb cover ranged from 1-49%, and over 92% of plots had forb cover ≥5% and one plot had <3%. HAF 8 plot was randomly plotted within grassland habitat. Abundant sagebrush habitat surrounds this site. Table 3.5 shows cover and height HAF plot data gathered in 2017.

TABLE 3.5: 2017 RED ROCK LIMA WATERSHED HAF DATA SUMMARY

Plot	Shrub Cover (%)	Shrub Ht (cm)	Forb Cover (%)	Forb Ht (cm)	Grass Cover (%)	Grass Ht (cm)
HAF 1 (G)	45	59	32	21	68	36
HAF 2 (G)	35	18	1	3	47	26
HAF 3 (P)	35	60	5	12	58	40
HAF 4 (P)	30	33	44	13	43	32
HAF 5 (P)	32	31	30	17	67	34
HAF 6 (P)	17	32	6	12	53	25
HAF 7 (G)	9	14	19	11	61	28
HAF 8 (G)	0	0	34	17	53	11
HAF 9 (G)	47	36	13	6	36	35
HAF 10 (P)	48	57	27	16	55	27
HAF 11 (P)	37	44	29	15	48	32
HAF 12 (P)	33	42	15	17	83	32
HAF 13 (P)	47	74	49	13	65	32

*G = Sage Grouse General Habitat Management Area (GHMA)

**P = Sage Grouse Priority Habitat Management Area (PHMA)

Assessment, Inventory, and Monitoring (AIM) data gathered between mid-August and the beginning of October, 2016 within sage grouse GHMA and PHMA found a range of sagebrush cover between 0-45%, with 6% between 15-25%, 56% of the plots <15%, and 38% with >25% sagebrush cover. Sagebrush height ranged from 0-63 cm, and 50% of plots within 30-80 cm and 50% with shrub height <30 cm. Perennial grass cover ranged from 14-86%, perennial grass height ranged from 22-50 cm, perennial forb cover ranged from 5-41%, and forb height was 13-38 cm with 81% of the plots ≥18 cm. Table 3.6 shows AIM data gathered within sage grouse GHMA and PHMA in the RRLW in 2016 (16 of the 20 AIM plots).

TABLE 3.6: 2016 RED ROCK LIMA WATERSHED AIM DATA SUMMARY WITHIN SAGE GROUSE GHMA AND PHMA

Plot	Shrub Cover (%)	Shrub Ht (cm)	Forb Cover (%)	Forb Ht (cm)	Grass Cover (%)	Grass Ht (cm)
AIM 1 (G)	5	27	12	19	57	41
AIM 2 (G)	3	19	33	25	42	31
AIM 3 (G)	37	59	39	24	53	36
AIM 4 (G)	13	17	9	19	48	22
AIM 6 (G)	28	63	14	33	45	41
AIM 7 (P)	27	52	17	24	42	31
AIM 10 (G)	3	43	21	25	65	49
AIM 11 (P)	33	30	15	38	74	37
AIM 12 (G)	0	0	23	16	14	32
AIM 14 (P)	45	43	23	34	57	50
AIM 16 (G)	18	12	41	24	37	25
AIM 17 (G)	9	47	5	29	42	45
AIM 19 (P)	3	24	23	13	40	35
AIM 20 (G)	27	56	29	37	60	48
AIM G1 (G)	0	0	23	22	86	29
AIM S2 (G)	1	16	19	14	52	41

*G = Sage Grouse General Habitat Management Area (GHMA)

**P = Sage Grouse Priority Habitat Management Area (PHMA)

HAF and AIM data, as well as the interdisciplinary team's (IDT) professional on the ground assessment and observations were used to determine that, overall in the RRLW, sage grouse habitat objectives are being met. Sagebrush canopy cover is high at the majority of the HAF plot sites, which was also noted in these areas during the field assessment.

Juniper and Douglas-fir expansion into sagebrush habitat was also noted in several allotments, including Cedar Creek, Radio TV, and Roe West. Sagebrush habitat loss to conifer expansion can be detrimental to sagebrush obligates, especially species of conservation concern, such as the sage grouse (Baruch-Mordo et al. 2013, Knick et al. 2013). Although some avian species of tree and cavity nesters may benefit from conifer expansion, grassland and sagebrush obligates decline with increasing conifers (Coppedge et al. 2001, Rosenstock and Van Riper 2001, Reinkensmeyer et al. 2007). The variety of sagebrush communities provide structure and cover for special status species that require tall dense sagebrush such as sage thrasher, Brewer's sparrow, sagebrush

sparrow, and loggerhead shrike. Golden eagles, prairie falcons, great horned owls, and ferruginous hawks inhabit and forage in sagebrush grassland habitat. This is also important habitat for pronghorn, mule deer, elk, sage grouse, and pygmy rabbit. Pygmy rabbits occupy sagebrush habitat year-round on both sides of Interstate-15 in the Snowline area, along the east face of the Tendoy Mountains, and in the Henneberry Ridge area. Pygmy rabbits require sagebrush for forage and cover, as well as deep alluvial soil to dig burrows. Sagebrush comprises nearly 100% of their winter diet and over half of their summer diet.

The area from McKenzie Canyon to Clark Canyon Reservoir and northeast of I-15 between Lima and Monida lie within the Lima/Sweetwater Breaks key raptor management area. This area was designated through Fish and Wildlife 2000 and the 2006 Dillon RMP as amended because of the concentrated nesting density of ferruginous hawks, prairie falcon, golden eagles and other raptors in the 1980s to mid-1990s. Since that time, there has been a decline in ferruginous hawk breeding territories, while no apparent changes to habitat have occurred (USDI, 2005). These changes may be related to declines in prey availability or impacts on wintering/migration habitats. Management objectives for the key raptor management area include maintaining sagebrush steppe and mountain mahogany habitat, and controlling disturbance of nest sites.

Mule deer browse juniper, however palatability can be poor and the high levels of volatile oils may cause mule deer to select against the foliage in favor of other browse when available (Dietz and Nagy, 1976). The volatile oils in juniper may interfere with rumen microorganism function, reducing energy supply for mule deer. Juniper provides hiding and thermal cover for big game, especially during the winter. Juniper woodlands provide nesting habitat, migratory corridors, and winter food and cover for birds on sagebrush grassland edges (Sieg, 1991). While juniper provides hiding and thermal cover, as well as browse, its expansion into mountain mahogany, aspen, sagebrush, and riparian deciduous shrubs is more detrimental to the loss of those species as cover and forage. The Lima Peaks mule deer population is extremely resource limited by heavy wildlife browsing on preferred species and conifer competition (pers. comm. Fager, 2017). Concerns for moose revolve around impaired habitat with declining mountain mahogany and conifer expansion into mahogany and riparian woodlands. Projects to enhance mountain mahogany and riparian shrubs would greatly benefit big game in the watershed.

Fencing across the landscape can create barriers and collision and entanglement hazards for wildlife, especially if not built to wildlife-friendly standards. Motorized travel on routes that are not designated as open reduces big game security, degrades riparian areas, increases the spread of invasive weeds, and increases erosion. All of these effects reduce big game habitat quality. Since closed routes are routinely traveled in the watershed and the 2006 Dillon RMP as amended guidance of signing open roads is not effective, it is recommended that closed routes be signed as closed.

Mountain mahogany is an extremely palatable and important food source for deer, elk and moose. Most accessible plants throughout the watershed show moderate to heavy levels of browse, especially noted along the east face of the Tendoy Mountains. Heavy browsing appears to be killing mountain mahogany in the Bell Canyon area, where decadence was a noted concern during the assessment. Juniper and Douglas-fir expansion is also shading and outcompeting mountain mahogany in several locations. Reducing this competition should be a priority for retaining this important species on the landscape. Planting mountain mahogany should also be considered within the watershed. Although ungulate browsing is a major concern for the

survivability of planted mahogany, planting on a trial basis is worthwhile for this declining species.

Effective July 31, 2017 the U.S. Fish and Wildlife Service (FWS) announced that the Greater Yellowstone Ecosystem (GYE) population of grizzly bears is a valid distinct population segment (DPS) and that this DPS has recovered and no longer meets the definition of an endangered or threatened species under the Endangered Species Act (ESA) (USDI, 2017). The RRLW allotments on the east side of Interstate-15 are within the DPS area which delineates the legal boundary where grizzly bears are delisted. West of I-15 is outside of the DPS and grizzly bears are still a listed species on that side of the watershed. There are no confirmed grizzly bear sightings within the RRLW, although they're likely to move into the area as the GYE population continues to expand.

Wildlife, including special status species, are discussed further under the Biodiversity section of the RRLW Assessment Report, pages 38-73. See the Biological Evaluation in Appendix C of this document for Threatened, Endangered, and special status species. Several Special Status plants occur within the RRLW. Please refer to Appendix D for a description of these species, and their known habitats. There are no special status fish within the watershed.

Resource Concern #2 Socioeconomics

Ranching and farming are critical components to the economic well-being of the various communities in Beaverhead County. Of Montana's 56 counties, Beaverhead County is the largest livestock producer. The USDA Census of Agriculture Inventory indicated that there were 153,655 head of cattle, calves, and beef cattle, as well as 16,191 sheep and lambs inventoried in Beaverhead County in 2012. Very few grain fed cattle were produced. The focus was on calves and feeder steers along with beef cows or breeding stock. The data from 2012 reports that, Beaverhead county ranked 1st in total cattle, 5th in sheep numbers and 2nd in total hay production within the state.

Within the RRLW there are 12 different business entities or individuals currently authorized to grazing livestock on the 69,730 acres of BLM managed public lands. Grazing within the RRLW provides operators important spring, summer, and fall forage for their grazing livestock. There are 11,348 Animal Unit Months (AUM's) of forage allocated on the 28 grazing allotments within the RRLW. The BLM stocking rate on these allotments range from 2.2 acres/AUM to 36.1 acres/AUM. These variations are based on soil, vegetative type, topography, and local weather. Cattle are the primary type of livestock authorized to graze on the allotments, however limited horse grazing, as well as indigenous (bison) grazing are authorized.

Qualified individual or business enterprises are issued a term (not to exceed 10 years) grazing authorization. Many of these ranches use the allotments that combine public and private land pastures in a comprehensive management plan. In most cases, private land owned by the authorization holder, is adjacent to, or intermingled with BLM administered land, and may be within the allotment. All aspects of the ranching operation including calving, breeding, haying, shipping, summer pasturing, and marketing schedules are planned and implemented with reliance on annual use of public land allotments during a portion of the grazing season. Changes in number of livestock, seasons of use, and/or increased labor inputs may have a considerable economic impact on individual operators.

BLM grazing fees are calculated using the formulas required by 43 CFR 4130.8 and are considerably less than those charged by private landowners. In 2004, the average fee in Montana for grazing on private land was $16 per AUM based on Montana Agricultural Statistics Service, National Agricultural Statistics Service figures, and the minimum fee charged on Montana State Lands was $5.48 per AUM. In 2017, these same fees rose as the average fee in Montana for grazing on private land was $24.00 per AUM, and the minimum fee charged for Montana State Lands was $14.01 per AUM. The BLM and Forest Service used the same formula to derive a $1.87 per AUM fee in 2017, which makes federal land the least expensive grazing available to area ranchers. In 2018, the federal grazing fee is $1.41 per AUM.

On page 252 of the Dillon RMP/Final EIS, Table 48, Employment and Labor Earnings by Major Type and Sector in 2000, reports that private on farm employment accounted for 17% of total employment in Beaverhead County. Refer to Table 56 on page 286 of the Proposed Dillon RMP and Final EIS, which shows employment and labor income response coefficients related to livestock grazing, timber management, and recreation use for the area influenced by the Dillon Field Office. In addition, page 251 of the EIS presents personal income statistics from 2000 that indicate that labor earnings are the largest source of income in Beaverhead County.

The BLM sells permits authorizing firewood removal and Christmas tree cutting which may be utilized in areas of the RRLW.

Three commercial outfitters are authorized under Special Recreation Permits to conduct big game hunting in all or part of the RRLW. The majority of their commercial trips occur outside the watershed but they are authorized to operate within the watershed. One commercial guide school is authorized under a Special Recreation Permit to operate in portions of the RRLW. The RRLW straddles the boundary of the Blacktail Mountains/Sage Creek Outfitter Permit Area (OPA) and the Horse Prairie/Tendoys/Big Sheep Creek OPA and includes a small portion of the Centennial Mountains OPA. No other active Special Recreation Permits exist within watershed boundary. Special Recreation Permits would be consider on a case-by-case basis.

The majority of lands within the RRLW are used yearlong for a variety of dispersed recreational uses including; hunting, fishing, off-highway vehicle use, camping, and mountain biking. The heaviest recreational use of these lands occurs during the big game hunting seasons. Recreation and tourism are important components of the local economy. Recreation within the RRLW provides substantial contributions to the local economy.

Resource Concern #3: Noxious and Invasive Species

Noxious weeds are defined in the Montana Weed Management Plan as "plants of foreign origin that can directly or indirectly injure agriculture, navigation, fish or wildlife, or public health." Currently there are 38 weeds on the statewide noxious weed list that infest about 7.6 million acres in Montana. Of these 38 weeds, three are of major concern in the RRLW: leafy spurge (*Euphorbia esula*), spotted knapweed (*Centaurea maculosa*) and houndstongue (*Cynoglossum officinale*). Canada thistle (*Cirsium arvense*), another state declared noxious weed, is also found throughout the RRLW. It is widespread throughout the Dillon Field Office and mostly found in riparian areas making treatment difficult.

Leafy spurge is found in three small infestations in the RRLW. The first is a small infestation that was discovered by the assessment team in the southeast corner of Allotment E. Another infestation is found in a dry wash in sections 26 and 35 in the southern portion of the Cedar

Creek allotment, where ownership changes from BLM to State. The third is the largest infestation and is located on state land within the Shoshone Cove allotment. These two infestation have been aggressively treated by both Beaverhead County and the BLM since 2003, and in 2017 only a few scattered plants were found.

A large infestation (200 acres) of spotted knapweed was found in 2002 in the Bell Canyon allotment. This infestation was initially treated by helicopter in 2002 and again in 2005 with ground treatments applied by both BLM and Beaverhead county crews in the years since. A reduction in infestation size has been seen but due to the ruggedness of the terrain, new satellite infestations have been found in the area. Other infestations are mostly small in size and are found scattered throughout the watershed, primarily along roads accessible to the public. Due to its location, the potential is high for knapweed to be spread by vehicles, livestock, wildlife, recreation and other activities.

Houndstongue is found scattered in trace amounts in various locations within the watershed along roads, trails, and streams. Because of its seeds ability to cling to hair and clothing, the potential is high for it to be spread rapidly within the watershed.

There are four other noxious weeds that have been found in the RRLW that have the potential to impact the watershed if allowed to spread. They are; yellow starthistle, rush skeletonweed, dyer's woad and a yellow – dalmatian toadflax hybrid. Yellow starthistle was found in June of 2010 in the Limekiln canyon area by a hiker. It was pulled and the area sprayed and inventoried and to this date no other plants have been found. Rush skeletonweed was found in 2015 in the median of Interstate 15 south of Snowline exit by a county spray crew. It appeared that the plant had probably went to seed the year before but the area has been inventoried for the past two years and no new plants have been found. Dyer's woad is found in about a half mile wide area centered on the railroad tracks from Lima to Snowline. This infestation has been aggressively treated by hand-pulling and with herbicide at least three times a year since the early 90's. The number of plants found has steadily declined with only 518 plants being found with none having produced seed. The toadflax hybrid, which is a cross between yellow and dalmatian with traits of both plants, was found about 2.5 miles north of the Monida interchange along the frontage road. Despite this plant showing some resistance to herbicide the infestation size and density has steadily decreased.

Cheatgrass *(Bromus tectorum),* an invasive annual grass, has established and is spreading into disturbed areas, as well as drier south facing slopes in areas naturally devoid of vegetation, throughout the RRLW. Infestations were observed by the IDT during the 2007 and 2017 field assessments along stream corridors and adjacent uplands, specifically on warm south or west facing slopes. It is an extremely competitive early cool season species that flourishes in disturbed sites. Old mining sites, roads, construction locations, burned areas and other disturbed areas can allow cheatgrass to become established. Once established, cheatgrass, a winter annual, has the potential to change (shorten) the fire return interval because it dries out in early summer and becomes a fine, flashy fuel. It tends to form monocultures, displacing native vegetation and adversely affecting habitat quality and biodiversity. Seed sources are present throughout most of the watershed so there is high potential for it to spread into additional areas of natural and/or human-caused disturbance.

In 2009 the BLM aerially treated 100 acres of cheatgrass in the Bell Canyon allotment. This treatment was followed up the following spring with a planting of native seed (blue bunch

wheatgrass). When this site was revisited by the IDT it was noted that the treatment had little to no effect with the size and density of the infestation remaining about the same as in 2007. The failure of this treatment can probably be attributed to many causal factors including: application using insufficient water volume in the aerial treatment for the herbicide to penetrate through the duff layer to the soil, lack of a follow up to the treatment, and timing of the treatment. A treatment done during the same time period on Bureau of Reclamation managed land near Clark Canyon Reservoir had about a 70% control rate initially but was followed up with a spring treatment of Glyphosate (Roundup), which increased the control to almost 100%. In 2017, this site is showing some reestablishment coming from the highway but overall is still cheatgrass free.

Following the Mauer mountain fire in the summer of 2017 two drainages that were known to have cheatgrass infestations were treated upon green up. All treated areas were then seeded, before spring greenup, with a native seed mix. Due to an early snow fall and rough terrain parts of the area weren't able to be treated but were treated in the spring of 2018 following snowmelt. Treated areas were GPS mapped and will be monitored to determine the results of this project.

Since 1989, BLM has been involved in cooperative control efforts with Beaverhead County. Private land owners in the RRLW have also been involved in control efforts. Throughout this period, the goal has been to prevent new noxious weed infestations and control or eradicate existing infestations in Beaverhead County using Integrated Pest Management.

Table 3.7 shows the herbicide treatments applied in the RRLW, including aerial treatments during the past five years. The acres treated as referred to in the table are the actual acres of weeds treated if they were all gathered together into one location. The total area that these weeds cover is a lot larger. In the table, the acres inventoried is an estimation of the total number of acres within the watershed that were covered during the treatment process. These inventoried acres aren't the same every year. In general, almost the entire watershed is inventoried over the life of this ten year assessment.

TABLE 3.7: WEED TREATMENTS IN THE RRLW

Year	Acres Treated	Acres Inventoried
2013	125	7000
2014	50	5900
2015	45	5500
2016	40	6000+
2017	50	6500+

In 2013 the BLM along with the Montana Department of Transportation and the area land owners aerially treated 150 acres (80 on BLM) of spotted knapweed along the interstate just south of Lima in an area that is hard to access by other means.

Due to the scattered nature of the infestations, the harshness of the climate and the elevation of the valley, no biological controls have been released. However, a release of both a seed head weevil (*Larinus minutus*) and a root boring weevil (*Cyphocleonus achates*) is being considered in the Bell Canyon allotment for spotted knapweed.

Resource Issue 4: Travel Management

The majority of lands within the RRLW are used yearlong for a variety of dispersed recreational uses including; hunting, fishing, off-highway vehicle use, camping, and mountain biking. The heaviest recreational use of these lands occurs during the big game hunting seasons, dramatically increasing the intensity of off-highway vehicle (OHV) use and camping. During this intense period of recreational use is when most of the unauthorized vehicle violations occur.

Corrections of mapping errors in the original route designations in the RMP as amended, and other minor adjustments to route designations would be made through this watershed assessment process. Travel management issues are a concern in the RRLW, although more localized as compared to some other watersheds. The watershed assessment process provides an appropriate avenue to refine those decisions due to the area specific focus across multiple resources. Some of the closed routes in the watershed are receiving regular use, including the ½-mile "jeep trail" that was closed in the previous watershed process for this area. A few routes are negatively affecting cultural resources.

The open habitat and relatively gentle topography of the RRLW has allowed the development of an extensive road network. Most of these roads are simple two-track trails that are used primarily during hunting seasons, and to access rangeland developments and monitor livestock. Without any travel restrictions, many of these routes were extended as far as topography allows or until they connect with other routes, often resulting in multiple routes to the same place, and short-cut trails to reduce driving distances. Many of these routes were designated open to wheeled motorized vehicle use in the Dillon RMP, as amended. Unfortunately, most of the routes that were identified to be closed in the original travel designations have continued to be used despite extensive efforts to clearly sign open routes, and eventually sign closed routes as well.

In recent hunting seasons, complaints from landowners, hunters and law enforcement officials have made it clear that rampant off-road vehicle violations in this area are responsible for degrading the hunting opportunities and experiences. FWP's wildlife biologist has also studied the impacts of the road network on wildlife use of the area, particularly mule deer and elk, concluding that overall road densities, and particularly illegal motorized use is impacting wildlife use and hunting opportunities. Recent conversations with area landowners, game wardens, and other land management agencies have resulted in the identification of this area for improved management of motorized vehicle use during the hunting season.

Resource Issue 5: Visual Resource Management

The 6,676 acres within the Bell-Limekiln Canyon Wilderness Study Area on the west end of RRLW, is managed as Class I. Preservation of the landscape is the primary management goal in Class I areas. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

A small portion of the watershed, 2,922 acres, located east of the Blacktail Mountains WSA is classified as VRM Class II. The objective of this class is to retain existing character of the landscape. Activities or modifications of the environment should not be evident or attract the attention of the casual observer. Changes should repeat the basic elements of form, line, color and texture found in the predominant natural features of the characteristic landscape.

The remainder of the watershed is classified as VRM Class III. VRM Class III objectives require partial retention of the existing character of the landscape and allow for moderate changes to the existing landscape. Management activities may attract attention, but should not dominate the view of the casual observer. Changes may be evident but may not detract from the existing landscape.

The visual resource contrast rating system would be used during project level planning to determine whether or not proposed activities would meet VRM objectives. Projects would identify mitigation measures to reduce visual contrasts and prepare rehabilitation plans to address landscape modifications on a case-by-case basis.

Resource Issue 6: Wilderness Study Areas

There are no designated wilderness areas within the watershed boundary. However, the majority (6,676 of the 9,650 acres) of the Bell-Limekiln Canyon Wilderness Study Area (WSA) is within the watershed boundary. This WSA is managed in accordance with BLM Manual 6330, entitled Management of BLM Wilderness Study Areas. Management according to this policy is intended to ensure that wilderness values within WSA are not impaired until such time as congress either designates the area as part of the National Wilderness Preservation System, or releases the area from further consideration as wilderness. If the Bell-Limekiln Canyon WSA is released by Congress the area would be managed to emphasize multiple uses. The VRM management class would be modified to Class II objectives rather than Class I.

The planning area was inventoried for lands with wilderness characteristics in accordance with BLM Manual 6310 – Conducting Wilderness Characteristics Inventory on BLM Lands, published in March, 2012. The purpose of an inventory is to determine the presence or absence of wilderness characteristics. The BLM must document existing conditions as opposed to potential future conditions. The inventory evaluates wilderness characteristics as defined in Section 2(c) of the Wilderness Act and incorporated in FLPMA. In order for an area to qualify as lands with wilderness characteristics, it must possess sufficient size, naturalness, and outstanding opportunities for either solitude or primitive and unconfined recreation. In addition, it may also possess supplemental values.

A small portion, 1,872 acres, of the Maurer Mountain LWC unit (MT-050-004N) is within the watershed boundary. This unit was originally inventoried in 1974 as a portion of the Big Spring Gulch (MT-076-004) unit. The area possess sufficient size, appears natural, and possess outstanding opportunities' for solitude and unconfined primitive recreation.

The documented presence of wilderness characteristics within this area does not mean that it requires these areas to be managed to preserve those characteristics. It simply means that any proposed activities that would impact these wilderness characteristics must be analyzed to assess the impacts to those wilderness characteristics. Future land use planning may consider a longer term objective for the future management of this area, and may or may not identify it for long term protection of these characteristics.

Resource Concern #7: Cultural and Paleontological Resources

A review of records on file with the BLM Dillon Field Office provides information concerning the number and type of known cultural resources and inventories conducted on public lands within the RRLW analysis area. A total of approximately 4,195 acres (6.0 %) of the BLM lands

in the RRLW have been inventoried for cultural resources at the Class III level. Cultural resource inventories have been completed for a variety of projects, including range improvements (fences, water developments), utility and road right-of-ways, land transfers and exchanges, fuel reduction, and timber sales. Cultural resource inventories range in size from less than one acre to 1,310 acres; although 41 acres is the average size of inventories. Public lands within Allotment E, Little Sheep, Lovell's Lake, Norris Canyon, Phalarope West, Roe, Seybold Individual, and Seybold Non-AMP allotments have no cultural resource inventory data.

A total of 79 cultural resources have been recorded in the RRLW. These include a variety of pre-contact and historic sites, including stone circles, cairns, effigies and alignments, lithic scatters, quarries, pre-contact camp sites, pictographs, historic cabins and associated artifact scatters, a historic gypsum quarry, Lewis and Clark National Historic Trail and associated camp sites, military route of the Nez Perce National Historic Trail, Union Pacific Railroad, Great Beaverhead Road and Henneberry House (also a public recreation facility). Many of these cultural resources are eligible to the National Register of Historic Places (NRHP); however, the majority of cultural resources in the RRLW have not been formally evaluated for eligibility to the NRHP.

No paleontological localities have been recorded in the RRLW assessment area. Based on geology, most of the area is mapped as having low to moderate potential fossil yield classification (PFYC 1-3) for paleontological fossils; however, there are small pockets of land in the Bell Canyon, Gallagher Mountain, and Radio TV allotments with high to very high potential(PFYC 4-5) for paleontological fossils.

Chapter 4 Environmental Effects

Introduction

This chapter discloses the scientific and analytic basis for comparison of the alternatives and describes the probable consequences (impacts, effects) of each alternative on the issues and resource concerns. The environmental consequences are disclosed and analyzed by alternative actions with past, present and reasonably foreseeable actions within the watershed.

Not every key issue and/or resource concern is relevant under each specific heading and therefore will not be discussed. And not every component within the key issues and/or resource concerns will be affected by the Alternatives (i.e. not every species of wildlife in the watershed will be affected). If key issues, resource concerns and/or specific components within an issue are not discussed, they were either not present, or present but minimally affected.

For each resource concern/resource issue, the predicted effects of the applicable alternatives are discussed below. Resource Issues and Resource Concerns are in the following order below:

Resource Issue #1: Riparian, Wetland, and Aquatic Habitat
Resource Issue #2: Upland Sagebrush and Grassland Habitat
Resource Issue #3: Forest and Woodland Habitat

Resource Concern #1: Special Status Species and Big Game Habitat
Resource Concern #2: Socioeconomics
Resource Concern #3: Noxious and Invasive Species
Resource Concern #4: Recreation and Travel Management
Resource Concern #5: Visual Resource Management
Resource Concern #6: Wilderness Study Areas
Resource Concern #7: Cultural and Paleontological Resources

Resource Issue #1: Riparian, Wetland and Aquatic Habitat Environmental Effects

Effects common to All Alternatives:

Livestock Management

Depending on topography and timing of use, livestock are generally expected to utilize riparian and wetland areas more than upland areas. Domestic ungulates, livestock, are drawn to and tend to congregate in riparian areas for the forage and water availability as well as favorable topography which they prefer over drier and often rougher characteristics of upland areas (Clary and Leninger, 2000). In two separate studies in Oregon, cattle were found to use the riparian zone 12 to 20 times more than upland areas and 80% of the forage came from the riparian zone (Skovlin 1984). Ungulates will affect riparian and wetland vegetation, channel substrates, suspended sediment, and channel morphology under all alternatives including the no action alternative to some degree.

The long-term presence of ungulates in a riparian area can result in an undesirable shift in the vegetative community as deep rooted species like sedges, may be replaced with shallow rooted

species such as Kentucky bluegrass. Along a stream channel this can cause streambank instability which could induce physical changes to channel shape that diminish a streams ability to properly provide its major ecological function to route water, energy, sediment, and nutrients. Diminished riparian and stream function has a detrimental effect on the associated aquatic habitat attributes such as channel substrate composition and embeddedness, streamside vegetation, and stream temperatures (Clary and Leninger, 2000; Clary and Webster, 1989). The shift in vegetative community and the resultant described effects may be considered a direct and/or indirect effect to riparian function and channel morphology. Livestock can also have a direct effect on riparian health and channel morphology by inputting sediment through hoof action and streambank impacts which may result in increased width/depth ratios (reducing the streams ability to process sediment), and create banks more susceptible to erosion (Bengeyfield 2004).

In wetland habitat, the long term presence or intense use of livestock can alter the attributes that define wetland condition including: water quality, water regime, soils, physical form, invasive flora, and vegetation health, structure, and composition (Morris and Reich, 2013). Livestock treading can physically damage wetland plants and soils which can affect the above listed attributes. Saturated or near saturated soils associated with wetlands have low mechanical strength and easily breakdown under the intense use by ungulates. Pugging can often be the result and pugging depth will increase with repeated treading in wet soils. Pugging and the direct breakdown of plants through livestock treading can create bare ground and alter surface elevations (hummocks) which can adversely affect infiltration rates, duration of inundation, water holding capacity, vegetative health and composition, erosion of soils, and risk for invasive species (Morris and Reich, 2013).

Herbivore grazing is a natural process that has shaped the evolution of plants for millennia (Hendrickson and Olson 2006). Grazing, along with fire, was the first vegetation manipulation tool ever applied by humans. Plants have evolved mechanisms to promote their growth after a single grazing event. At proper intensities, timing of use, durations and adequate rest before a repeated grazing event, livestock grazing can have a beneficial effect on plants found in riparian and wetland areas and every plant can prosper in a grazed system (Hendrickson and Olson 2006). Planned grazing management promotes healthy riparian plants and a healthy community by facilitating natural processes such as nutrient cycling and decomposition which often leads to a more diverse system (Laycock 1994). In wetland plant communities that have no grazing, plants can become choked or suppressed by the accumulation of litter (dead plant material) which slows plant decomposition and nutrient cycling and stifles plant diversity. Livestock grazing can be successfully used to reduce litter and promote new plant growth (Evans, 1986). Under a well planned grazing management system, riparian and wetland plants can meet the riparian health standard as well as site specific objectives.

Utilizing use thresholds as tools to indicate livestock movements helps to improve overall watershed conditions with or without the proposed management changes. This analysis is based on the assumption that these allowable use levels and associated livestock rotations are employed in a timely manner. A four inch sedge stubble height threshold would benefit stream channel morphology by reducing impacts to stream banks and bank-holding riparian vegetation in most areas, but is not expected to initiate significant progress toward meeting PFC on its own. Clary and Leininger (2000) recommend a four inch residual stubble height guideline as a starting point

for improved riparian grazing management while acknowledging that six inches of stubble height may be required to reduce browsing of willows or limit trampling impacts to vulnerable stream banks. Annual use thresholds may reduce excessive wetland hummocking and drying. Improvements in stream channel morphology and reduced impacts to streamside wetlands would reduce sediment input associated with channel erosion.

As described in Chapter 2, the BLM encourages, and if warranted, will require use of temporary electric fence, livestock supplement (e.g., salt, protein block) placement, riding, and herding as a means of improving livestock distribution in all alternatives. When used, livestock supplement would continue to be placed on ridges or terraces at least ¼ mile from the nearest livestock water source, and where possible in areas naturally devoid of vegetation. Under all alternatives this improves cattle distribution and forage utilization away from sensitive riparian areas (Bailey, Welling and Miller 2001).

If and where riding and herding is emphasized and utilized to improve livestock distribution and reduce the amount of time cattle spend in riparian areas, an improvement in riparian condition would be expected. BLM technical reference # 1737-20, *Grazing Management Processes and Strategies for Riparian-Wetland Areas* (Wyman, 2006) states: "Successful application of low-stress stockmanship enables the rider or range manager to control the duration that plants and soils are exposed to grazing animals. This controls overgrazing and over resting, both of which lead to deterioration of range health. Proper handling can thus improve livestock distribution and rangeland condition and trend, and lead to improved riparian conditions that benefit fisheries and wildlife while improving water quality."

Also common to all alternatives is the annual use threshold of greenline stubble height. Chapter 2 states a four inch stubbles height minimum along greenlines of non-fisheries or non-native fisheries streams and six inch on WCT streams would be included in the terms and conditions of the term grazing permits of all allotments. Clary and Leninger concluded a streamside stubble height of approximately four inches is near optimal to maintain forage vigor, entrap and stabilize sediment, reduce trampling of streambanks, sustain forage intake and cattle gains, and divert cattle from browsing willows (Clary and Leninger, 2000).

Non-Commercial Mechanical/Prescribed Fire Treatments

The effects of the non-commercial and prescribed fire treatments that were identified in the 2007 RRLW EA would be similar to those disclosed in the analysis of *Impact Common to Action Alternatives* below.

Riparian Vegetation Treatments

Maintenance of previously completed riparian conifer treatments would maintain the upward trend of riparian vegetation increasing in abundance and/or vigor along these reaches. The return or continued improvement of desirable riparian vegetation would have a beneficial effect on riparian habitat, aquatic habitat, and stream processes. Modified Greenline monitoring data pre-treatment, and five to seven years post-treatment, has showed varying results thus far but overall trend is meeting desired project objectives. Over eight sample reaches from across the field office, the dominant cover for riparian shrubs (willows, dogwood, aspen, etc.) has increased cumulatively by 204% with an average change of 26%. Mesic shrubs (shrubby cinquefoil, rose, chokecherry, etc.) have increased cumulatively 34% with an average of a 4% increase, while bare soil has decreased along the greenline by an average of 6% (Appendix E, Table 5).

Alternative A (No Action)

The No Action Alternative would not meet riparian, wetland, or aquatic habitat objectives along stream reaches and/or at springs where resource concerns were identified. Stream morphology (channel shape and gradient) which is essential to maintaining stream channel stability, would continue to be impacted. Vegetative composition, cover and vigor, would continue to be negatively impacted. Sediment inputs into streams, generated by human activities, would continue at the same levels.

Current trends and conditions of aquatic habitat would continue under the no action alternative. Habitat conditions on streams not meeting habitat requirements would not be expected to appreciably improve over the life of this plan. Habitat in an upward trend or PFC condition such as found in the majority of fish habitat would be expected to continue to improve or stabilize in PFC condition.

Livestock Management
On allotments where riparian and aquatic habitat is present, it is anticipated that under Alternative A (No Action) the current conditions would persist.

One allotment, Snowline AMP, did not meet the riparian standard due to livestock grazing within the Pine Butte Pasture. Within this pasture, livestock would continue to be grazed under a 3-treatment spring, fall, rest grazing sequence for an average of 48 days per year when grazed. This use has resulted in physical damage to riparian resources, and overall poor distribution throughout the pasture. Post grazing utilization monitoring conducted in 2017 by the Dillon Field Office found upland utilization varied from 18-25% within the Pine Butte Pasture, however riparian utilization was "high". Within the Pine Butte Pasture there are several riparian resources that did not meet PFC. Typically physical alterations to these resources from livestock use was a primary causal factor for not meeting the standard, followed occasionally by vegetative departures (I.E. Typically, the vegetative component of the riparian system continues to be intact). These conditions would continue under Alternative A.

Within the Gallagher Mountain Allotment, one reach (#80), was found to be FAR, however the allotment as a whole was determined to meet the riparian and water quality standards. Reach 80 is located in the Dry Mast pasture. The pasture is scheduled for a two treatment rest rotation grazing system, in which the pasture is used during the spring between 5/1-5/31 every other year. Commonly use has been deferred to later in May with a resultant shift into June as well. Heavy spring livestock use of reach 80 has resulted in shifts in the vegetative, hydrologic and geomorphological processes on the reach. Reach 80 would continue to function at risk under Alternative A.

Within the Gallagher Allotment, one Reach (#14), was found to be FAR, however the allotment as a whole was determined to meet the riparian and water quality standards. Reach 14 is located within the Upper Bill Hill pasture. This pasture is part of a 4 treatment rest rotation grazing system, in which the allotment is grazed for a portion of the growing season for three years, with rest the fourth year. Use is scheduled for an average of ~34.5 days per year. This use has resulted in some bank instability and head cutting, as well as little improvement to riparian vegetation composition over the course of the past 10 years. Reach 14 would continue to function at risk under Alternative A.

Within the Cedar Creek allotment, two reaches (#925 and #901) were rated as FAR-up. Reach 925 did not meet PFC due to several headcuts, while reach 901 did not meet PFC due to head cutting, varying width/depths, and lack of woody species regeneration. Currently the allotment is managed under a 3 treatment rest rotation system. The allotment is grazed for approximately 5 weeks during May/June for two years, then rested the third. Under Alternative A these reaches would continue to Function at Risk with and upward trend towards achieving PFC.

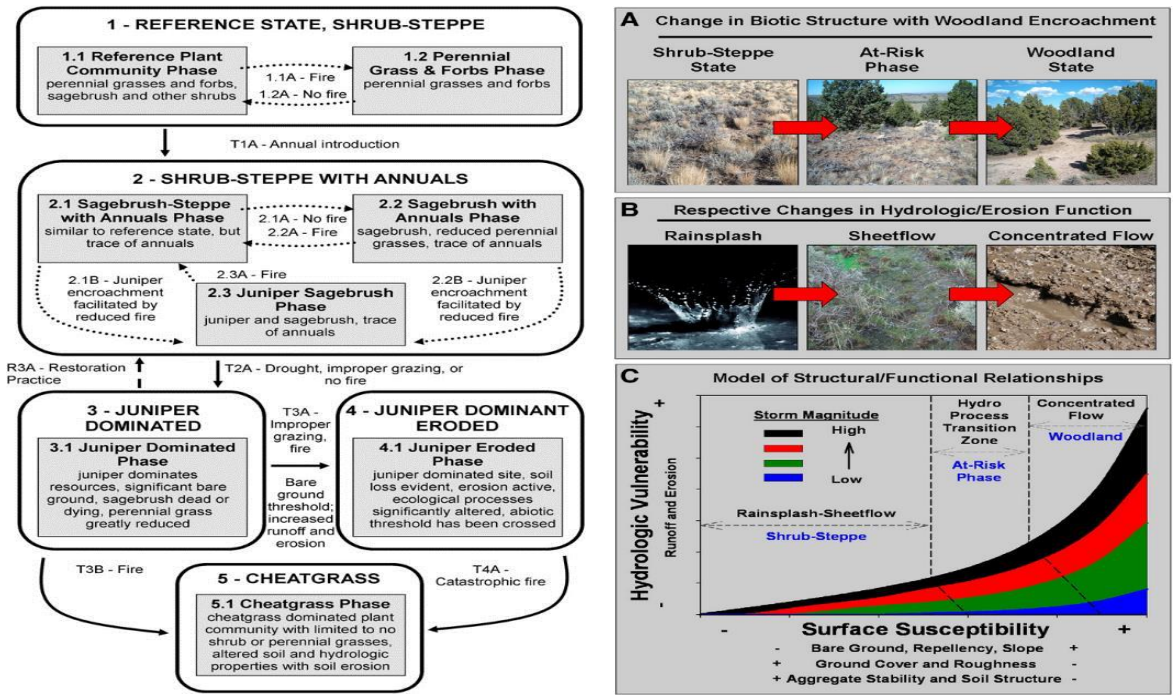
Forest and Woodland Treatments

Without the salvage of dead/dying timber and the thinning of high density conifer stands, the risk for a high severity wildfire would increase as described further in the analysis of Issue #3. Higher severity wildfire would result in greater risk for increased run-off and erosion as described in the Prescribed Fire analysis. Higher run-off and sediment input as a result of possible increased fire severity would have adverse effects on riparian and aquatic habitat.

Conifer Expansion

Without active management or natural disturbance, Rocky Mountain juniper and Douglas-fir would continue to increase at the expense of other upland shrub and herbaceous species and riparian species along some streams. Rocky mountain juniper has an extensive stoloniferous root system (above ground shoots) which is very efficient in competing for limited water and soil nutrients. Based on water-use models for individual trees, the U.S. Forest Service estimates that mature juniper tree densities, ranging from nine to 35 trees per acre, are capable of utilizing ***all*** of the precipitation delivered to a site in a 13-inch annual precipitation zone (Deboodt et.al. 2008). The reduction in moisture available to understory vegetation and the increase in shade can result in more bare ground, which would increase erosion potential resulting in increased sediment inputs into streams (Figure 4.1).

FIGURE 4.1: WOODLAND EXPANSION AND SHIFT IN BIOTIC STRUCTURE AND HYDROLOGIC/EROSION FUNCTION (WILLIAMS ET AL., 2014)



delivery to waterways would have a detrimental effect on riparian and aquatic habitat by increasing fine sediment load (Williams et. al. 2014). An increase in sediment load has the potential to exceed a channel's threshold to transport material, therefore potentially impacting channel geometry and adversely effecting stream function.

Riparian, wetland, and aquatic habitat is also affected hydrologically by the conversion from sagebrush steppe habitat into woodland habitat. With the reduction in ground cover comes reduction in infiltration and the increase of concentrated flow paths, and therefore the residence time of water throughout a basin may shorten dramatically. A reduction in residence time can amplify the peak of a watersheds hydrograph as more water travels to the receiving stream faster. Peak discharge would be greater but the duration of elevated flows would be less. An exaggerated peak discharge can have degrading effects on a stream channel, particularly if the channel is already at risk of accelerated bank erosion due to conifer expansion as further described below.

In the no action alternative the progression of conifer expansion and loss of sagebrush steppe habitat would continue unchecked. The associated loss of ground cover and increased sediment delivery to waterways would have a detrimental effect on riparian and aquatic habitat by increasing fine sediment load (Williams et. al. 2014). An increase in sediment load has the potential to exceed a channel's threshold to transport material, therefore potentially impacting channel geometry and adversely effecting stream function.

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A reduction in residence time can also have a detrimental effect on late season water availability. Studies have shown a decrease in available soil moisture, groundwater, and streamflow later in the summer season with the presence of conifer invasion into sagebrush steppe habitat (Deboodt et.al. 2008; Kormos et. al., 2017). A reduction in available groundwater, soil moisture, and streamflow would have a detrimental effect on riparian and aquatic habitat as well as all water users downstream. Reduced water availability would limit vegetation production in riparian zones and less phreatic input in the hot summer months could degrade water quality by increasing water temperature. As water temperature increases, dissolved oxygen would decrease and aquatic flora would likely increase. An increase in aquatic vegetation would result in more biomass decay and consequently a greater biological oxygen demand, further limiting oxygen and aquatic organisms.

Riparian Conifer Expansion

Under the No Action Alternative no new riparian vegetative treatments proposed in this EA would occur. Without active management or natural disturbance, Rocky Mountain juniper and Douglas-fir would continue to increase at the expense of other riparian woody and herbaceous

species. As riparian vegetation is replaced by conifers, streambanks would become susceptible to accelerated rates of erosion. Riparian shrubs (e.g.; willows) and sedges create a deep and dense root mat that is typically contiguous along a streambank. In contrast, individual Douglas-fir and juniper trees are spaced away from each other creating more bare ground; thus a streambank more susceptible to erosion and mass failures. A decrease in vegetative cover along the channel margins also limits the amount of sediment that is entrained during out of bank flow events. Increased rates of erosion and reduced ability to trap sediment produces excess sediments within the channel itself and to all receiving bodies of water. If riparian vegetation is lost to conifer expansion, proper stream function and processes would be lost and the result would be degraded riparian and aquatic habitat and water quality.

Riparian, Wetland, and Aquatic Habitat Enhancement or Restoration:
Under the No Action Alternative no riparian, wetland, or aquatic restoration projects could be completed. Where streams are degraded due to entrenchment, the channels are disconnected from their floodplains and often they lose sinuosity. These conditions cause a shift in both erosional energy and bedload/sediment transport capability creating systems that do not fulfill the natural processes of a functioning riparian area.

Without action to restore stream gradient, sinuosity, and access to floodplains, streams would remain degraded or continue to degrade. Channels would continue to produce excess sediment as they do not have the ability to properly dissipate energy or store sediments in their floodplains. Aquatic habitats would also suffer as rates of typical scour and deposition do not exist which results in homogeneous habitat that lack quality pools throughout an entire system. Incised stream channels also lower the adjacent water table which is detrimental to habitat throughout the riparian corridor. A lower water table would continue to inhibit growth of desirable riparian woody (willow, aspen, etc.) and herbaceous (sedge, rush) vegetation and can encourage the expansion of conifers into what should be the riparian zone.

Where wetlands or mesic areas have been degraded, the expanse of the potential wetted area is often reduced or is actively shrinking. Similar to stream channels, where degradation has occurred the water table has dropped causing a shift in vegetation from obligate or facultative-wet species to upland species of grass and shrubs.

Without action to restore or enhance riparian and aquatic habitat, riparian and wetland areas throughout the landscape would remain departed from their ecological potential and unable to attain desired future conditions. Where passive restoration (management changes) is resulting in an upward trend, improvement would continue within the current capability of the system.

Effects Common to Action Alternatives

Livestock Management:
Livestock grazing tools that are available and are proposed to be used by the BLM to address Rangeland Health standards that are not met are shown in the RRLW Assessment Report Appendix B. Please refer to that document for further information. Revisions of livestock management included in the action alternatives were generally developed in cooperation with the grazing permittees/lessees in order to increase support in implementation and success in meeting resource objectives. Ehrhart and Hansen (1997) selected 71 reaches on private land which were either functioning properly or functioning with problems, but exhibited an upward trend. General conclusions associated with this successful management of riparian areas suggest that

what operators do to encourage livestock not to loiter in the riparian zone is more important than either season of use or length of time in the pasture. Ehrhart and Hansen (1998) acknowledge that there are "numerous techniques available for developing and implementing an appropriate prescription to address any given riparian ecosystem." The only required ingredient which portends potential success was "serious commitment and personal involvement on the part of the operators and managers." Alternatives developed in consultation with affected lessees have an improved chance for success for this reason.

Revised livestock management is predicted to improve riparian vegetation, stream channel morphology and sediment transport and a decrease in sediment inputs into the streams generated by human activities at varying degrees and timeframes in relation to the No Action alternative. Grazing treatments proposed for managing livestock across allotments and alternatives in the RRLW include: reduced livestock numbers, changes in class of livestock, reduced duration of use, changes in timing of use, adding rest or deferment into the systems and/or structural projects (offsite water developments, fences). Each of these revisions or combination of treatments have been developed to address site specific concerns identified during the RRLW assessment and are predicted to make progress towards site specific objectives at varying degrees and timeframes.

While different opinions exist within the scientific community regarding the best season of use, there is consensus that the length of time animals spend in a riparian area can be a significant factor in the condition of that area. According to Marlow and his colleagues (1991), "The most critical aspect in any grazing plan for the protection of riparian areas is the length of time cattle have access to a particular stream reach." Extended grazing during the hot summer season is generally considered most injurious to riparian zones (Ehrhart and Hansen 1997). Therefore, wherever the alternative includes reducing the amount of time that cattle have access to riparian areas, impacts are predicted to be reduced.

Water development in upland areas is often a key factor in reducing livestock watering in riparian areas. Offsite water is recommended by the State of Montana as a Best Management Practice (MT DEQ 2007) for water quality and restoration of stream channels.

Fencing the source would protect the associated habitat in the immediate vicinity. Ehrhart and Hansen, (1997) state "The one quantifiable factor which was highlighted in successful riparian management was *the presence of off-stream water*. Case studies, controlled experiments, and common experience all confirm that, unless discouraged from doing so, cattle tend to spend a disproportionate amount of time in the riparian portion of any pasture. Alternate sources of water appear to be an important tool to encourage livestock to move away from the riparian area". Alternative water provides cleaner water for livestock. If off-site water is located a sufficient distance from streams encouraging livestock to spend less time loafing and grazing in riparian areas, there would be a reduction in waste inputs to streams, soil compaction, channel impacts and grazing on riparian vegetation. Augmenting the water development with shade, such as placing the watering trough near existing trees, would also help to reduce the time livestock spend in riparian areas (Wyman, 2006). Design features for spring developments, listed in Section 2, would mitigate the potential of drying up or shrinking wetland areas associated with spring sources.

Fencing spring sources and associated wet meadows would benefit the spring's ecological functions and hydrological processes, conserve habitat for rare plants, if they are present, and improve existing habitat for wildlife. Wetland exclosures would mitigate and prevent livestock

induced hummocking, the compaction of moist wetland soil, and the subsequent raising of bumps or mounds. A common effect within riparian or spring exclosures is an increase in Canada thistle if it is present at the site prior to fencing. New exclosures would be monitored for noxious weeds and treated where necessary.

Fisheries habitat is closely tied to riparian habitat condition. During the 2017 field assessment, streams containing fishery habitat overall were found to be in PFC or in a FAR upward condition throughout the RRLW. However, site specific concerns were noted on Little sheep Creek. By implementing management changes such as those proposed under *Riparian, Wetland, and Aquatic Habitat Enhancement or Restoration* in Chapter 2, habitat conditions would be expected to improve. Improvements would include increases in riparian vegetative diversity and cover, a reduction in bare ground, stabilization of stream banks as well as a decrease in the level of localized sediment input via improved bank vegetative stability and cover and improvements to pool quality and quantity as overall riparian function improves.

Water Developments:
Developing springs requires varying levels of disturbance to capture and divert flow. With disturbance there is risk for reducing diversity or abundance of riparian communities by manipulating physical characteristics at the source and/or flow regimes. Design features as proposed, limit or eliminate development if it is determined that discharge is inadequate to support both a reliable water source for authorized livestock while maintaining wetland/riparian habitat. At all developments adequate water would be left at the spring source to maintain wetland hydrology, hydric soils, and hydric vegetation. In addition, float valves are to be installed to prohibit permanent diversions from the source. Once a trough is full or not in use, spring discharge would return uninterrupted to the riparian area it supports. The spring source and associated riparian habitat would also be fenced to exclude livestock.

Given the design features included for any proposed water developments, little to no adverse effects are expected to riparian, aquatic, and wetland habitat as a result of the proposed developments.

Stream Crossings:
Improvement of road/stream interactions would contribute to achieving properly functioning riparian areas and maintain or improve aquatic habitat conditions. Selection of the most appropriate stream crossings, i.e. culverts or hardened crossings, based on the site's geomorphic characteristics and use, would minimize the detrimental effects crossings can have on stream channel function and associated aquatic habitat.

Where applicable, and as identified in the action alternatives, culverts would be sized adequately for fish passage. All culverts should be sized with enough capacity to handle large flow events (2 year to 50 year return interval depending on site specific conditions and needs) so as not to restrict flow at the site. If a culvert is undersized it would have adverse effects on sediment transport, bank stability, and vertical stability due to manipulation of flow velocities. A culvert may not be appropriate if a channel has a broad floodplain and installation of the culvert would eliminate access to the floodplain or interrupt connectivity of floodplain flows (e.g.; channel types C & E, (Rosgen, 1996)). Restricting floodplain access can have a damaging effect to the riparian corridor and aquatic habitat by manipulating the streams natural scour and deposition patterns. This effect can induce erosion at the culvert site and may cause a chain reaction of accelerated erosion throughout the reach (Wargo and Weisman, 2006).

Hardened low water crossings or "fords" can often be the best fit for a site if the channel is well connected to its floodplain, carries high amounts of debris or sediment, has large flow fluctuations, or there is low frequency of use (USDA, 2006b). Low water crossings can be a direct source of sediment as wheeled vehicles transport material through the channel and can disturb the streambed and banks. If the streambed and/or approaches are comprised of fine grain material and the ford is not properly armored and stabilized, the site can be a chronic source of sediment with each passing vehicle. Compared to a natural (unimproved) ford, much less sediment appeared downstream of a hardened ford (streambed excavated and replaced with compacted rock and gravel) after vehicles crossed (USDA, 2006b). The longer-term effects of fords on water quality depends on factors such as type of surfacing on the ford and its approaches, vehicle type and use level, and time since disturbance for reconstruction or maintenance (USDA, 2006b). As vehicles cross through the water, there is also the potential for chemical pollutants (e.g.; oil, grease, copper, and nickel from brake wear) but there is no evidence that these constituents cause detectable or significant water quality problems at fords (Hyman and Vary 1999).

During installation of a culvert or low water crossings there can be and usually is a short spike in sediment concentration downstream. The same is true following the first high flow event following installation as disturbed soils are washed into the channel. Within an evaluation of numerous studies that measured change in sediment concentrations downstream during installation of either structure; Taylor et al. (1999) determined the contribution is typically a fraction of the total amount of sediment produced by a stream during a regular high flow event.

As stated initially, the improvement of stream crossings would have a positive effect on riparian and aquatic resources within the assessment area. If selection of the type of crossing is based accurately upon the sites geomorphic characteristics, with adequate design, the stream reach and watershed is expected to experience a reduction in sediment introduction from stream crossings. It is difficult to quantify the reduction at this time as exact site selection and final design at each site is not complete.

Riparian, Wetland, and Aquatic Habitat Enhancement or Restoration

Effects common to all restoration/enhancement actions is presented below. As applicable, effects unique to a proposed action category or specific action follows.

Effects Common to all Riparian, Wetland and Aquatic Habitat Enhancement or Restoration Projects

Work in and around aquatic resources may require the use of heavy equipment, including but not limited to, excavators, loaders, and dumps trucks within wetlands, stream channels and/or riparian areas. Due to in-stream and near stream equipment operation, stream enhancement projects may have short-term adverse effects including disturbance to riparian vegetation, exposure of bare soil, stream turbidity, fine sediment input, channel bed disturbance and increased risk of chemical contamination from fuel and lubricants. Some proposed actions may utilize hand tools in place of heavy equipment. Where hand tools are utilized, disturbance of soils and vegetation and the intensity of turbidity or sediment released would likely be less. Hand tools may slightly prolong project duration therefore extend the duration of the effects of each action but adverse effects would still be short-term. The design features provide assurances that potential adverse effects would be limited in scale and duration and therefore are considered short-term.

Per the action descriptions and design features, removal of riparian/wetland vegetation would be minimized, limited to the work area, and ground cover would be replaced by the application of native mulch, weed free straw, or erosion blankets. Additionally, straw wattles or other perimeter control BMPs would be applied as necessary. It is expected that where disturbance occurs, vegetation would reestablish within two years. Similarly, bank disturbances would be limited to the site of equipment activity; bank conditions up and downstream of the activity would remain stable. Adverse effects would be minimized or eliminated through successful application of the project design features and application of BMPs.

Sediment depositions and turbidity would be short term as described above. Inputs of fine sediment would typically be limited to the time of activity and would not be expected to be measureable beyond a few hundred feet downstream from a project. It is expected that any introduced fine sediment would be transported, sorted and/or deposited in the first high flow of the season and would become a small, immeasurable percentage of the stream's sediment load. Project-generated sediment would not affect downstream gravels or pool volume. Similarly, any increases in turbidity would cease upon completion of instream equipment operation. Expected long-term benefits of improved floodplain access, sediment routing/storage, and bank stabilization to riparian/aquatic habitat and species would far outweigh potential short-term adverse effects.

When heavy equipment is operating in or near water, there is the potential for fuel or other contaminant spill. Project design features include prohibiting equipment storage, maintenance and re-fueling within 150 feet of flowing water, frequent inspection for leaks, and spill contingency materials would be kept on site at all times. Further, all equipment would be power washed and free of debris or excessive fluid accumulation prior to operations. These design features reduce the risk to the lowest degree possible and adverse effects are not expected from fuel spills.

A. Stream Restoration and/or Enhancement

The actions proposed include: induced meandering, grade control, floodplain grading, channel relocation, instream habitat enhancement, head-cut stabilization, and streambank stabilization.

The proposed actions to restore sinuosity, stabilize streambanks, restore/maintain channel slope, restore/maintain connection to adjacent floodplains and/or create new floodplains would have a long term beneficial effect on all aquatic resources within the watershed. Sediment and bedload storage capability would be restored within riparian areas treated, sediment input to downstream impaired waters would be reduced, instream habitat would improve, and riparian habitat would improve within the watershed.

As applicable, unique effects to specific stream restoration actions are elaborated on below.

Induced Meandering

The purpose of induced meandering is to accelerate the channels return to a state of dynamic equilibrium (stability) where channel processes (scour/deposition, groundwater exchange, nutrient cycling, etc.) are functioning as appropriate to the valley type and bedload characteristics of the stream. As depicted in Figure 2.1 this process is termed *channel evolution*. Channel evolution requires the breakdown of banks and/or terraces by deflecting the erosive energy of the stream itself into the banks or terrace. The purpose of breaking down streambanks is to produce material (bedload and sediment) that can be used to build downstream bars which

eventually become the new floodplain as lateral migration persists. Structures would be spaced longitudinally down the channel to mimic the expected frequency of scour and depositional features; therefore the rate of new bar development would equal the rate at which material is produced by bank erosion. At an induced meandering project in southeast Arizona to improve habitat for federally listed fish species that requires low turbidity "A significant portion of the sediment coming out of each terrace cutbank was captured by the next downstream point bar, so that the overall sediment supply of the treated reach was decreased, even as specific banks were intentionally eroded to induce meandering."(Zeedyk and Clothier, 2009)

Bank stabilization

While streambank erosion is a natural process, anthropogenic influence can decrease bank stability and accelerate rates of bank slumping and erosion. This action uses rock, bio-degradable erosion control fabric, and/or plant materials (e.g., dormant cuttings of willows and other plants that root easily) in a structural way to reinforce and stabilize eroding streambanks. Streambank vegetation increases the sheer stress of a stream by increasing the surface area of the substrate it flows over. Increased sheer stress would result in reduced stream velocity which in turn can lead to sediment deposition and/or the creation of refugia by biota.

Long-term beneficial effects of stabilizing eroding streambanks include reductions in fine sediment inputs and subsequent stream turbidity. Placement of wood and vegetation would also increase aquatic habitat complexity, providing cover and velocity refugia during high flow events.

Floodplain Grading and Channel Relocation

In unconfined river reaches, side channel habitat and connectivity is dynamic, changing with river migration, sediment transport and deposition, and seasonal variations in flow. Floodplains and side channels reduce the flow energy within the active channel by functioning as an energy dissipater for the stream during high flow periods. Furthermore, during a flood, when streams exceed bankfull width and overflow onto the floodplains, stream energy and flow velocities are reduced, allowing sediment to deposit. This channel-floodplain interaction develops the conditions for a healthy riparian-floodplain plant community, builds banks, shapes channel geometry, and encourages nutrient cycling.

In both the long term and short term, improving floodplain connection or restoring flow to abandoned channels would decrease mainstem flow velocities, reducing bank erosion potential. Increased storage of fine sediment on the floodplain reduces in-channel fine sediment and provides a nutrient-rich substrate for vegetation establishment. Further, reconnection of side channel and alcove habitat increases refugia for juvenile fish during high flows.

B. Wetland and Wet Meadow Restoration

The actions proposed include installing structures to disperse flow across wetland and wet meadow (mesic) habitat where degradation has occurred.

The actions proposed would have both a short term and long term beneficial effect on watershed health by improving/restoring capacity for water storage and restoring desirable wetland/mesic habitat. Less sediment would be mobilized down valley as active head-cuts would be stabilized and concentrated flow in gullies would be slowed and/or dispersed. By attenuating flood peaks, the magnitude of peak discharges for the drainage would be reduced which may reduce erosive energy in channels downstream.

Condition and productivity of riparian and/or mesic vegetation would be maintained or improved as hydrologic regime would be maintained or restored. Conversely, upland species that have encroached into mesic meadow habitat would be stressed and eventually replaced by mesic or riparian species. High elevation mesic meadow restoration utilizing water spreading and slowing structures in Gunnison, CO showed a 24% increase in plant productivity (Silverman, 2018). Over a six year period, vegetative species monitoring for the projects in Gunnison showed an average increase in wetland species cover of 250%, overall plant cover increased by 297%, the number of species doubled, and bare ground decreased from 35% to 2% cover (Rondeau, 2018).

Some wetland meadows degraded by livestock exhibit hummocks and micro-channels that can drain the wetland and lower the water table (Booth, 2014). Cattle can form hummocks through wetlands by compacting organic wetland matter into trails that dewater the wetland so that drying and erosion create and maintain hummocks (Corning, 2002). In contrast a properly functioning wetland, absent of channels caused by trailing of livestock, will slow, spread, and store water and are highly effective at sequestering carbon (Booth, 2014). Restoring surface elevations across a wetland area would eliminate inter-hummock channels and encourage the area to slow, spread, and retain water at a rate that matches local topography, thus expedite the wetlands return to properly functioning condition or desired future condition. The improvement of water storage would have beneficial effect on aquatic habitat and the hydrograph downstream as water may be released later into the summer. Reduction in concentrated flow paths would also eliminate erosion around the base of hummocks which would reduce the long term contribution of sediment to downstream aquatic habitat and reduce loss of productive soils.

A piece of tracked equipment exerts a relatively small amount of ground pressure. For example a D8 dozer weighing almost 90,000 pounds exerts about 13 pounds per square inch (CAT, 2016). It is also expected that the next season's freeze-thaw action would act as means to loosen and "de-compact" the soils as mitigation for any minor superficial compaction that occurs. There are no expected adverse effects to soils due to compaction.

The exposure of bare soil is expected to be minimal as vegetation would not be removed but possibly displaced as hummocks are leveled into surrounding low spots. There would therefore not be large contiguous areas of bare soil following construction, only patches and spots throughout. The existing vegetation is expected to quickly colonize any available bare soil created. These types of wetland sites do not have a high gradient from one end to the other and in some cases may be concave in vertical relief. Without channelized flow, this reduces the opportunity for surface flow to have the energy to maintain velocities to transport soils offsite. Regardless, seed and structural erosion control measures would be applied if needed to reduce or eliminate erosion and sediment transport offsite as a result of these projects.

C. Riparian Planting

Riparian planting is utilized to increase shade, hiding cover, future potential woody debris, streambank stability, and species diversity. Planting riparian vegetation decreases areas of bare soil and provides a sediment filtering buffer. As plantings and riparian vegetation matures, width-to-depth ratios of disturbed channels and fine sediment delivery would decrease.

Site preparation and planting is not expected to result in stream sedimentation or erosion. Planting of native riparian vegetation would result in an increase in diversity and abundance of riparian vegetation and a decrease in sediment.

Non-commercial Mechanical/Prescribed Fire Treatments

Non-commercial mechanical/prescribed fire units typically leave out riparian areas. Often, riparian areas are found on the perimeter of the prescribed burn areas because they make a relatively safe boundary due to the wet-green vegetation and standing water. Prescribed burns on adjacent hill slopes are not expected to directly affect the riparian areas unless intentional as part of project design. If resource specialists determine fire would best meet the objectives for a given riparian area (i.e.; conifer expansion and/or initiate woody regeneration) the burn plan may intentionally include the riparian corridor. Burning within the riparian area would temporarily remove vegetation from the area and the risk for sediment input into the adjacent waterway may be elevated until vegetation can recover. Design features included in chapter 2 would mitigate for potential adverse effects of burning within a riparian zone. In addition, for reasons cited in the analysis of Alternative B under the sub-heading *Willow Regeneration,* adverse effects are not expected and long term beneficial effects would be expected; particularly if resource specialists determined fire would best meet management objectives within the riparian.

On adjacent hill slopes, fire can increase surface runoff and erosion rates by removing vegetation and changing the soil's hydrologic properties providing a readily erodible layer of sediment and ash. In relation to surface runoff, erosion and water quality, the characteristics of a fire likely to be most important are fire severity, burn patchiness, burn season and fire frequency (Cawson et al., 2012).

Fire severity can be measured by the amount of above ground and below ground organic matter consumed during a burn (Keely, 2009). Relative to uncontrolled wildfire, prescribed fire is usually dominated by areas of low severity fire. Less run-off and erosion is expected from areas of low severity burn compared to areas of high severity (e.g., wildfires) (Elliot et al, 2016; Cawson et al., 2012). Elliot et al. modelled erosion following wildfire in a basin in current condition (no-treatment) versus the basin after it had received a prescribed fire treatment. Results indicated that mean erosion run-off was nearly half if the area was treated pre-wildfire. Prescribed fire reduces fuel loads and reduces the likelihood of high severity wildfire occurring and degrading watershed condition.

Burn patchiness can influence how effectively runoff and sediment producing areas connect to catchment outlets (Cawson et al., 2012). The variation of fire severity and burnt and unburnt patches create a mosaic of patches. Patchiness can break up concentrated flow paths mitigating for the potential of elevated sediment runoff of burned sites. Runoff and sediment yields can be greater for plots where bare patches are located at the bottom of the plot and narrow strips at the bottom of a hillslope can prevent runoff from connecting to the hillslope outlet (Cawson et al., 2012). Prescribed burn units within the DFO are identified to improve overall watershed health (wildlife, hydrologic, etc.) therefore an even burn across an identified unit is typically not part of the design nor would it usually be possible given fuel type or condition (relative humidity); patchiness in burn pattern and severity is naturally built into prescribed burns within the DFO.

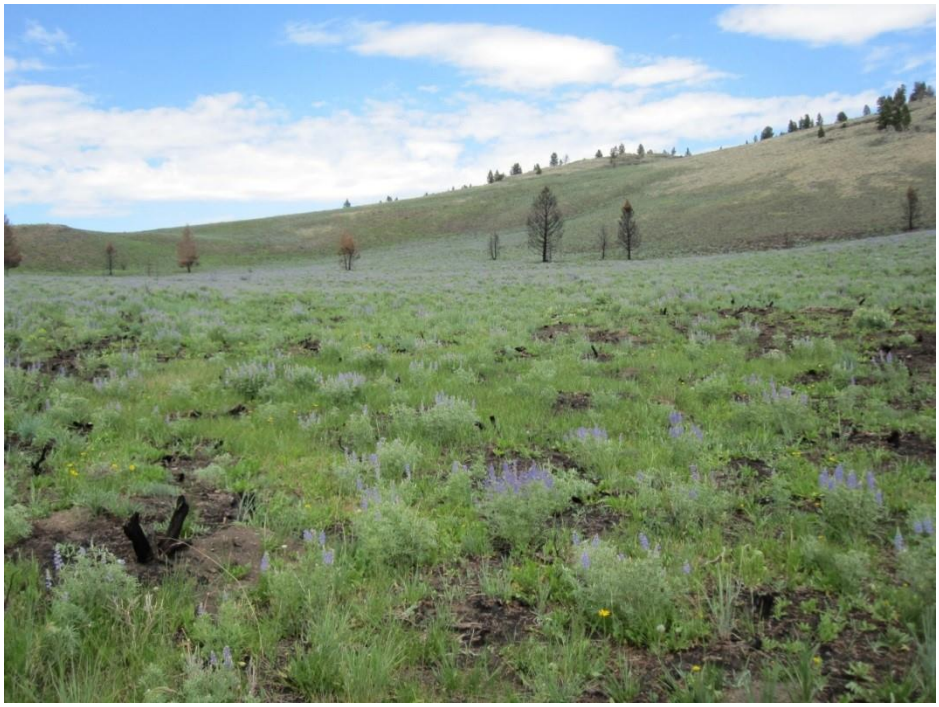
PHOTO 4.1: BELL CANYON BURN UNIT 4-6 WEEKS AFTER TREATMENT. PHOTO SHOWS PATCHINESS OF BURNED AREAS ON THE SLOPE IN THE BACKGROUND OF THE PHOTO

Spring and fall are the preferred seasons for prescribed burns. Weather is usually mild and fuels can still be relatively moist but dry enough to burn. These conditions allow for a controlled environment more conducive to meeting project objectives and minimizing potential adverse effects. Spring season prescribed fire allows for immediate utilization of spring growing season. The immediate flush of grass over a burned area mitigates the potential for increased erosion over a site as flow paths are short and broken and infiltration is improved. Late season fall burns have the potential to cause more runoff and erosion partially due to high fire severity, lower patchiness of late season burn, and less time to recover before post-fire rainfall or snow melt (Townsend and Douglas, 2000). Design features included in chapter 2 for prescribed fire would mitigate for potential adverse effects related to late season fall burns. Regardless of the season, the control provided by prescribed fire combined with reduction in fuels reduces the potential for wildfire occurring in the late summer followed by potentially heavy rains in the fall.

PHOTO 4.2: WISCONSIN CREEK BURN UNIT, MAY 2008. PRE-TREATMENT

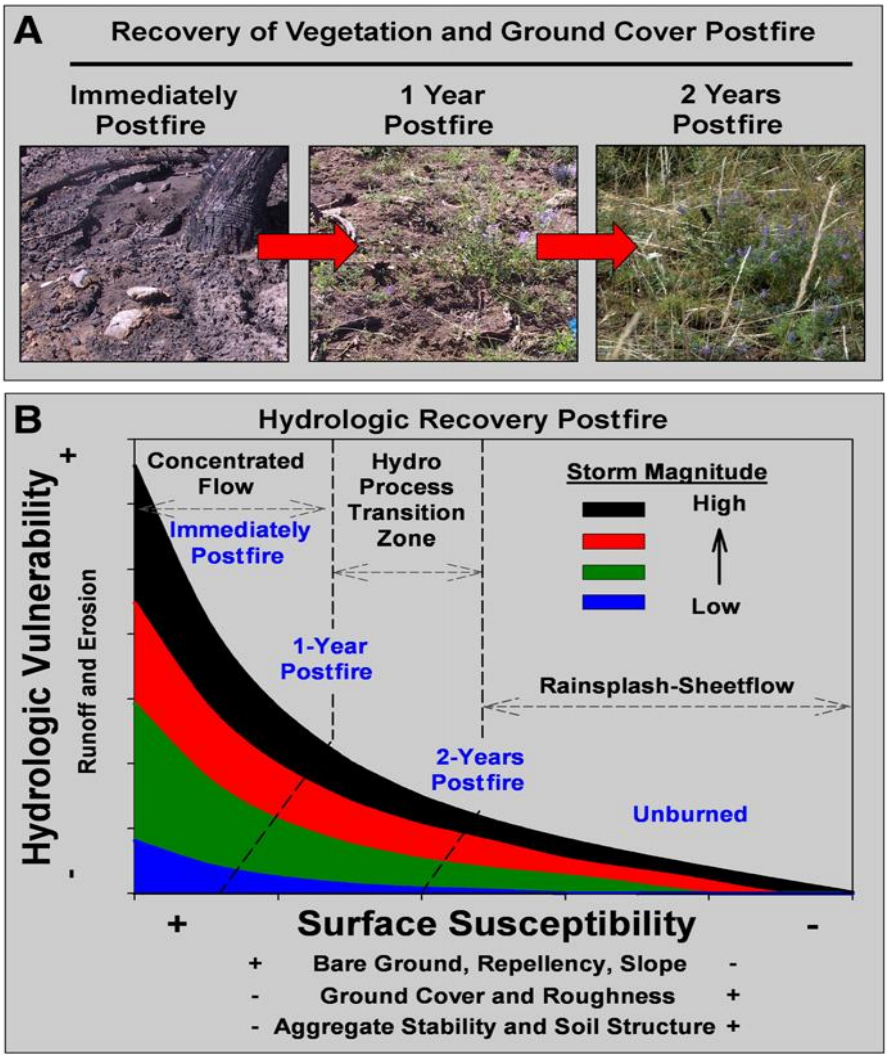
PHOTO 4.3: SAME BURN UNIT SHOWN ABOVE, JULY 2010. 1 YEAR POST TREATMENT. 100% HERBACEOUS GROUND COVER WITH PATCHY SAGEBRUSH

PHOTO 4.4: BELL CANYON UNIT CLOSE UP, 4-6 WEEKS FOLLOWING BURN



Areas of sagebrush steppe habitat being lost to conifer expansion is often the target area for prescribed fire. Hydrologically, reducing the amount or rate of conifer expansion is beneficial. Figure 4.1 in the analysis of the No Action alternative depicts concentrated flow paths developing as the biotic structure shifts from grass and brush to conifer dominance. Figure 4.2 below depicts the return to grass and brush dominance following fire. The example in Figure 4.2 depicts a wildfire and shows recovery starting 1 year post fire; the reality of a prescribed burn is recovery much faster, almost immediately if implemented in early spring, Photos 4.3 and 4.4 above. An increase in ground cover following fire reduces runoff and improves infiltration which can improve soil moisture on site. Retaining or improving infiltration and soil moisture anywhere within a basin can positively affect riparian and aquatic habitat at that basins outlet whether it be a spring, wetland, or stream (Deboodt, 2008; Kormos et al, 2017).

FIGURE 4.2: STABILIZATION AND HYDROLOGIC RECOVERY POST-FIRE (WILLIAMS ET AL., 2014)



Alternative B

Livestock Management

Under Alternative B, livestock grazing management changes which would affect riparian habitats are proposed on the following allotments: Snowline AMP, Gallagher Mountain, Gallagher, and Cedar Creek. Impacts to riparian and aquatic habitats on all other allotments from livestock grazing management would be the same as Alternative A.

Snowline AMP: Within the snowline AMP, grazing use within the Pine Butte Pasture would be modified from a spring, fall, rest cycle with an average use period of 48 days per year to a twice over, fall, rest cycle with approximately 30 days of use per year. When use is scheduled for twice over, spring use in June would be restricted to no more than 14 days (6/6-6/19).

Additionally the fall use periods would be deferred, beginning October 1st or later compared to the No Action alternative that begins on September 3rd. Under Alternative B, the number of spring/summer grazing days would be reduced from 47 days per cycle to 14 days per cycle.

Additionally these days would occur when temperatures are typically much cooler (early-mid June compared to mid to late July) compared to the No Action Alternative. This is expected to improve livestock distribution within the Pine Butte Pasture by utilizing the pasture when upland vegetation is typically much greener and more succulent (Clary and Webster, 1989), as well as when daytime temperatures are lower, reducing livestock demand for water. As livestock spend more time in the uplands, they would be spending less time within the riparian zones. The Dillon Field Office utilization data collected in 2017 shows that ample upland forage exists to accommodate more grazing in the uplands while still meeting the upland utilization threshold. Also with a 14 day growing season grazing period, riparian areas would have the potential to recover, as there would be adequate time within the growing season for plant maintenance. The fall use period would also be modified. Use would vary from 14 days to 1 month during October depending on the year. In October, the riparian soils are typically either dryer or frozen, reducing their susceptibility to compaction and physical damage from grazing ungulates. Additionally, daytime temperatures are typically cooler as day length shortens. Finally, livestock may be weaned by the October use period. In these cases only dry cattle (not nursing a calf) would be in the pasture. Dry cattle typically travel further from water, and there would be less total animals within the pasture. Therefore livestock impacts to the riparian zone in October would be less compared to early September. Use later into the month of October may result in increased browsing on woody species such as aspen and willow, however adherence to the stubble height stipulations should ensure that ample herbaceous forage exists to reduce livestock use on woody browse. While the number of grazing days has been reduced, Alternative B would allow more livestock to graze the pasture, for no net change in authorized forage. The authorized use periods have been modified within Alternative B to improve distribution away from riparian areas. Under Alternative B, monitoring would occur to measure whether riparian trends are improving. If improvement is not occurring the authorized forage would be reduced, to facilitate improvement to the riparian conditions. In addition to modifying the authorized periods, two to three new upland stock watering locations are proposed, as well as increasing the water storage on two existing water locations to improve livestock distribution within the pasture. Collectively the livestock grazing management modifications and projects would reduce livestock impacts to the riparian systems within the Pine Butte Pasture, and allow them to move toward PFC.

In addition to the proposed changes in the Pine Butte Pasture, pasture management may become modified within the Field A3 Shearing Plant, Field 4 A, and Dutch Hollow North pastures. The proposed changes would not measurably change the grazing management, therefore no new impacts to reaches 909 and 910 are expected. Both reaches are at PFC or FAR with and upward trend.

Gallagher Mountain: Under Alternative B the grazing rotation on the Gallagher Mountain grazing allotment has been modified. Grazing use within the Dry Mast pasture would change from grazing it every other spring under the No Action Alternative to grazing it every other year alternating between spring use and fall use. Therefore the pasture would receive spring grazing once every fourth year under Alternative B. By reducing the number of spring use days on the system, it is anticipated that livestock distribution into the uplands and out of the riparian bottoms would improve. Additionally during fall use periods there is potential that livestock may be weaned. Therefore, the total number of livestock within the pasture would be lower, and the dry cattle would utilize uplands better than a cow/calf pair with a young calf. As stated above

the grazing rotation has been modified across the entire allotment. By shifting use to the dormant periods, riparian soils and banks may be dry or frozen. The physical damage to stream banks from livestock use is expected to be reduced compared to the No Action Alternative. There could be more utilization on woody browse species under this alternative compared to the No Action, however stubble height restrictions, periodic spring use period and rest are expected to maintain vigor of woody browse species. The rotation is similar to the existing rotation, with several side board requirements addressing grazing duration, rotations, and rest, all of which are intended to ensure that natural resource conditions throughout the allotment, including riparian and aquatic habitats continue to be maintained. All other stream reaches were assessed to be PFC or FAR up within the allotment and these conditions and trends are expected to be maintained.

Gallagher: Under Alternative B the grazing rotation would be slightly modified within the Upper Bill Hill Pasture. Modifications would include not scheduling livestock within the Upper Bill Hill Pasture for more than 29 days. Additionally the permit would include stipulations limiting livestock grazing to not more than 29 days regardless of stock density. Under the No Action Alternative riparian vegetative communities have remained static over the past 10 years with little change in green line composition. The proposed action would reduce the duration livestock spend on reach 14 from ~34.5 days per year when grazed to not more than 29 days. This represents ~16% decline in the duration, with no increase in livestock number. Reduced use and duration on the reach 14 is expected to help improve greenline composition. As greenline composition improves and banks begin to become more stable, the system is expected to move towards PFC.

Cedar Creek: Under Alternative B, the grazing permit on the Cedar Creek allotment would change from grazing during the spring for two years followed by rest to grazing for two years during the dormant period (11/1-3/30) followed by rest. By shifting use to dormant season use, the physical impacts of grazing and trailing along the riparian systems would be minimized due to frozen or dryer soils. Additionally, livestock use of the uplands would increase, as livestock demand for water is typically less because temperatures are lower, and cattle are typically dry (no nursing calf). Shifting use toward the fall may result in increased woody browse use, which was a concern on the upper portion of reach 901. Both Reach 925 and 901 are expected to remain in FAR up condition moving toward PFC. This transition toward PFC is expected to be quicker under Alternative B compared to the No Action.

Forest and Woodland Treatments

As disclosed in the analysis of Issue #3, Forest and Woodland Habitat, the proposed harvest would reduce the potential severity of wildfire and the risk of excessive erosion and run-off delivering elevated rates of sediment and discharge to Clark Canyon Creek. Reducing this risk may have a long term benefit to the riparian health of Clark Canyon Creek and the aquatic habitat of the Beaverhead River.

Adherence to SMZ laws and receiving all applicable permits for the installation of temporary culverts minimizes potential adverse effects to riparian and aquatic habitat. While the impacts of the action of installing and removing culverts would be temporary and minimized, there are always inherent risks to culverts. These risks are disclosed above under the heading of *Stream Crossings* within the Impacts Common to Action Alternatives section.

The proposed removal of timber is not expected have a measurable effect on riparian and aquatic habitat. Design features would minimize soil disturbance and the scale of harvest is not expected have any hydrologic effect on the respective basin. The *maximum* proposed harvest of 1,188 acres accounts for roughly 11% of the Clark Canyon HUC6. The prescription/s include both selective thinning and patch cuts up to 5 acres. Both methods reduce canopy interception of precipitation resulting in the possibility of greater snow accumulation on the forest floor (Troendle et al. 2006; Woods et al. 2006). The magnitude of the increase in snowpack is directly related to the percent of basal area removed and any reduction in canopy would increase the amount of water in the snowpack (Troendle et al. 2006). Increased snowpack and snow water equivalent has the potential to contribute to streamflows but the amount varies on the type of forest treatment, the amount of precipitation received, and the timing of that precipitation. In a review of multiple paired watershed studies that measured changes in forest density and its effects on water yield, the general conclusion is that approximately 20% of the basal area of the vegetation must be removed before a statistically significant change in flow can be detected (Stednick, 1996; Troendle et al. 2006).

Riparian Vegetation Treatments

Riparian Conifer Expansion

Reducing sediment in the stream systems, increasing plant community biodiversity and improving bank stability are important riparian management objectives. Decreasing encroaching conifers (juniper and Douglas-fir) in riparian areas would benefit competing riparian deciduous woody and herbaceous species. Removing the juniper would provide an opportunity for the deciduous woody and herbaceous plant community to expand and prosper because of reduced competition for soil nutrients, available water and increased sunlight. Vegetative structure and species diversity decline in sites where plants compete with juniper for limited resources (Miller et al. 2000), because juniper can out-compete shrubs and herbaceous plants for water leading to reduced plant density and cover (Wilcox & Breshears 1994). Decreased vegetation structure in the areas adjacent to streams dominated by conifer could result in larger areas of bare soil which can impact infiltration rates and accelerate surface transport of water, nitrogen and other nutrients (Breshears & Barnes 1999; Reid et al. 1999). Reduced infiltration rates leads to higher erosion rates and elevated sediment suspension in water run-off (Davenport et al. 1998).

Over the long term, treatment of juniper in specified riparian areas is expected to increase deep-rooted riparian vegetation (aspen, willows, red-osier dogwood, sedges, etc.), decrease erosion and sediment transport, improve stream channel geomorphology and increase systematic water storage capability. Sediment input into the treated reaches may increase for the first several years and then decrease as vegetative cover along the greenline establishes. The increased cover would be more effective at trapping sediment coming from both in-stream and upland sources. Over eight sample reaches from across the field office that have received conifer treatments, the dominant cover for riparian shrubs (willows, dogwood, aspen, etc.) has increased cumulatively by 204% with an average change of 26%. Mesic shrubs (shrubby cinquefoil, rose, chokecherry, etc.) have increased cumulatively 34% with an average of a 4% increase, while bare soil has decreased along the greenline by an average of 6% (Appendix E, Table 5).

The speed of riparian improvement would be dependent on the volume of water in the stream, the composition of deciduous woody vegetation on the site pre-treatment, the stream type and the amount of post-treatment rest and livestock exclusion methods implemented (i.e. fencing, felled juniper orientation, hot tape, etc.) Although felled juniper is expected to protect stream banks

from livestock impacts, if juniper clogs the channel severe channel degradation could occur if a temporary "dam" blows out.

Riparian conifer removal treatments on fisheries streams would increase the diversity and density of desirable deciduous woody and herbaceous species that typically are more desirable for fishery habitat. These species, in most cases, stabilize stream banks and provide habitat supporting a diversity of terrestrial and aquatic insect populations.

Willow Regeneration

Prescribed fire within wetland polygon #2401 would introduce disturbance to the remnant Beaverhead River floodplain and would help spur deciduous woody regeneration. The effect of fire in a riparian area is largely related to the severity and the frequency of fire. Many common riparian plants such as willow, aspen, and cottonwood generally respond to low-to-moderate severity fire by sprouting but their thin bark makes stems and trunks vulnerable to high-intensity fires (Hankins, 2013). Following fire, the recovery of woody plant structure can be quite rapid, and within a year or two, woody plants can become impenetrable thickets, See Photo 4.5 below.

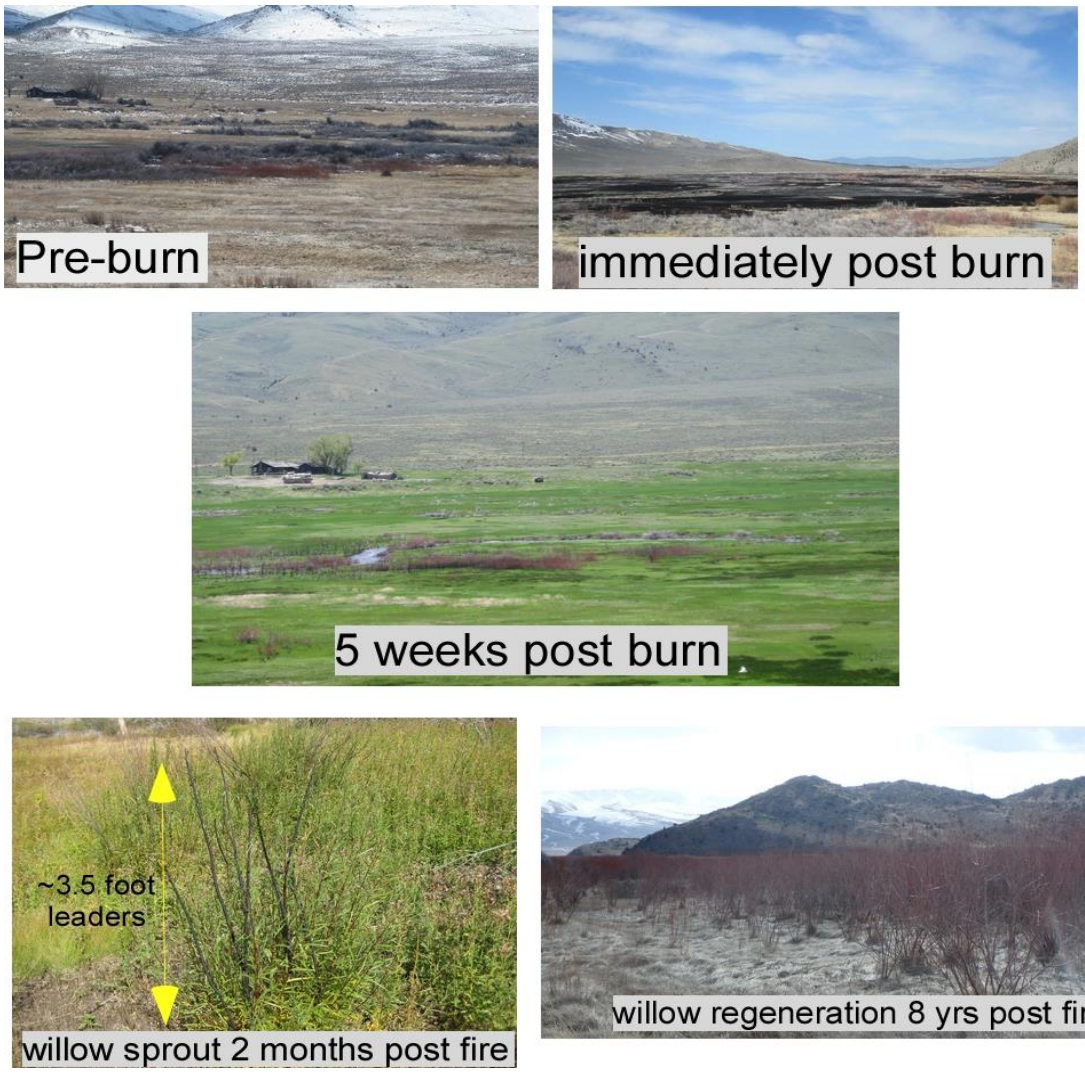
Given the lack of heavy fuel loads (conifers or large debris accumulations), the timing of proposed prescribed fire, and the inherent nature of riparian vegetation keeping fuel moisture levels relatively high, a low severity burn is expected. In the spring of 2014 the northern most portion of this wetland area was ignited by a recreationist and the results were as described above. Within the same year the willow recovery was rapid. Photo 4.5 below shows the area that was burned in 2014.

PHOTO 4.5: WILLOW THICKET ON THE OPPOSITE SIDE OF THE RIVER IS THE RESULT OF A WILDFIRE IN 2014. NOTE THE JUNIPER SKELETONS STANDING ABOVE THE WILLOWS (PHOTO TAKEN MARCH, 2018)

In the study by Hankins (2013), where native vegetation existed, fall and spring burning increased native species richness and the abundance of individual species generally increased. Native riparian species are resilient to disturbance and are adapted to rapidly colonize disturbed areas. Again, from Hankins (2013), fall burns created a competitive advantage for natives at their study site as fall burns coincided with the germination of non-native grasses and forbs. This enabled the native species to germinate and grow without competition from introduced species.

The ability of the native riparian species to colonize disturbed areas and the high likelihood of a low severity fire, bare ground as a result of the prescribed fire is not likely. Without bare ground, sediment contribution to the Beaverhead River as a result of the fire would be negligible. Photo 4.6 below shows a willow regeneration project completed with prescribed fire along Horse Prairie Creek immediately upstream of Clark Canyon Reservoir.

PHOTO 4.6: WILLOW RESTORATION PROJECT ON BUREAU OF RECLAMATION MANAGED LAND WITHIN THE RRLW, 2009



TRAVEL MANAGEMENT

Roads may physically alter the landform and landscape greater than any other management activity and pose a risk to multiple resources. Roads can alter sediment and hydrologic regimes, disconnect aquatic habitat, create slope instability, and convey invasive species.

Changing the designation of undesignated routes that currently receive traffic to designated routes provides a mechanism for these routes to receive proper maintenance (though the DFO admits that the amount of road maintenance needed across the landscape far exceed the means to complete). Maintaining designated routes for proper drainage would have beneficial affect to riparian and aquatic habitat. A well-drained road produces less sediment from the road surface and distributes/disperses flow captured in road side ditches rather than concentrating and discharging at a single point.

Physically closing routes with obstructions allows the opportunity for vegetation to reclaim the disturbed footprint of the road prism which can reduce sediment production. If the road beyond the closure is left in place, as it is, without additional drainage features installed, the road may still have a detrimental effect on the hydrologic and sediment regime of the watershed. Water would continue to be routed either by the road surface itself or in roadside ditches, and the risk for mass failure and disturbance are elevated as maintenance of the route is eliminated.

Physically obliterating road surface by re-contouring to match surrounding topography and seeding or planting on the disturbed surface provides the greatest benefit to watershed processes. Complete obliteration allows for flow paths to be restored and provides the greatest opportunity for revegation.

Alternative C

Livestock Management

Snowline AMP: Under Alternative C the Pine Butte Pasture would be split forming an East Pine Butte Pasture and a West Pine Butte Pasture. All of the projects discussed under Alternative B would to be constructed under Alternative C. The livestock would be managed within the main Pine Butte Pasture during the same period of use as is discussed under the No Action Alternative, however the cattle would be confined to each of the new Pine Butte Pastures for approximately half of the time. Therefore livestock use on each reach would occur for approximately 24 days per season compared to 48 days per season. This would increase the post grazing recovery period, or add additional deferment within these pastures. By reducing the area of riparian habitat available to the cattle, they would be forced into the uplands. Increased time within the uplands would reduce their impacts on riparian areas. Additionally, by improving the amount of upland water sources, livestock may be drawn out of the riparian bottoms and held up out of the bottoms for more time compared to the No Action Alternative. As with Alternative B, monitoring would occur to ensure that riparian trends are improving. If improvement is not occurring the authorized forage would be reduced, to facilitate improvement to the riparian conditions. Under Alternative C Riparian and Aquatic habitat within the Pine Butte Pasture is expected to improve.

Alternative D

Livestock Management

Under Alternative D livestock grazing would be eliminated from the Pine Butte Pasture. The riparian and aquatic habitats on BLM would move towards and would achieve PFC more quickly as compared to the other alternatives.

Grazing on riparian and aquatic habitat on adjacent private lands may increase as a result of eliminating BLM riparian from the pasture. The potential (severe) degradation of riparian and upland habitat that could occur on private lands may negatively impact BLM managed riparian and aquatic habitat as excess sediment is delivered downstream, or as vertical instability migrates upstream (headcut).

Cumulative Effects

All proposed actions within the action alternatives could mitigate for adverse effects to riparian and aquatic habitat caused by other past, present and reasonably foreseeable future actions depending on the geographic and temporal scope of the other action/s. The proposed actions would contribute to the net beneficial effect to riparian and aquatic habitat caused by past, present, or future watershed improvement actions taken depending on the geographic and temporal scope the other action/s.

If both riparian and upland improvement projects are implemented within the same subwatershed, the cumulative net benefit to land health would be greater than if implemented in separate drainage basins. As upland processes are restored, sediment and water delivery rates would be restored from the improved site/s further improving condition of riparian and aquatic habitat. If riparian processes at the receiving body of water were also improved by treatment, the effects of each treatment would compound on each other, magnifying the overall net benefit of each individual treatment.

Without action on BLM managed land to restore, enhance, or improve watershed processes, degraded BLM habitat would continue to add to the cumulative negative impacts across all management and/or ownerships. BLM managed land is positioned relatively high in elevation across a given watershed and is often at the top of a drainage. Therefore, if BLM managed riparian is not performing at its ecological and hydrologic potential, the resulting adverse impacts to riparian and aquatic habitat could have a cascading affect downstream, throughout the remainder of the drainage. As sediment is transported downstream at increased rates, habitat and channel processes downstream would continue to be adversely impacted. Incised channels do not effectively access and store water in their floodplains therefore peak discharges are amplified. Increased discharge equates to increased energy which would result in further riparian and aquatic habitat degradation downstream. In addition, if an active headcut on BLM is moving up valley, without abatement to stabilize that headcut, channel incision would continue upstream further impairing additional habitat regardless of management or ownership, perpetuating the cumulative adverse impacts. Without treating conifer expansion, the sediment and peak discharge impacts noted above would be further exaggerated as sediment supply would increase and peak discharges may increase (see Conifer Expansion heading above within the No Action analysis of Issue #1).

It is expected that use of our public lands will increase as populations increase. The results would be an increase is traffic along gravel and dirt roads and higher amount of sediment available for runoff to pick up transport to our waterways (WFPB, 1997). Without action to improve and enhance riparian processes that store and manage sediment as it moves downstream, increased sediment loads will cause further degradation of our riparian and aquatic resources.

The 2017 Montana Climate Assessment predicts earlier snowmelt and an earlier peak in spring run-off in the Mountain West. Earlier snowmelt and spring runoff will reduce late-summer water availability in snowmelt driven systems (Whitlock, et al. 2017) such as those within the DFO. Without snowmelt input, stream dependence on groundwater input will be elevated (Whitlock, et al. 2017). The capacity for storage of snowmelt and precipitation in shallow aquifers such as floodplains and wet meadows will be reduced under the No Action alternative. Without restoring or enhancing the processes that maintain diverse aquatic habitats, there would be less refugia in the form of pool habitat as late season flows are reduced. The prediction of warmer air temperatures and lower summer streamflows suggest increases in water temperatures. Without increasing shade by improving riparian vegetation or improving groundwater storage and input into the streams, the No Action alternative would provide for a less resilient condition of our watershed/s.

Resource Issue #2: Upland Sagebrush and Grassland Habitat Environmental Effects

Effects common to All Alternatives:

The upland health standard is being achieved throughout the watershed on all sagebrush and grassland habitats. With that being said, there are management actions that are being proposed that may impact sagebrush and grassland habitats. Across all alternatives livestock grazing permits would include "Other Terms and Conditions" encouraging or requiring the use of temporary electric fence, strategic placement of livestock supplement, and riding/herding to improve livestock distribution. Although strategic placement of salt is an inexpensive and effective distribution tool, research has shown that it is not as persuasive in modifying livestock distribution patterns as other commonly used supplements such as low-moisture blocks. The use of dehydrated molasses supplements is an effective way to lure cattle into underutilized uplands. In a study conducted on two Montana ranches, cattle remained within 600 meters of supplements, even when located on steep rugged terrain and relatively far from water (Bailey, Welling and Miller 2001). Temporary fencing may be the most effective way to improve livestock distribution, however this method has the highest costs. Regardless, strategies to move livestock into areas not traditionally utilized by livestock or to manage the timing and duration a particular area is subject to livestock grazing is considered beneficial to upland resources, specifically sagebrush and grassland habitats across the broad landscape. These techniques manage the use, duration, and number of grazing bouts vegetation receives by livestock grazing, especially in areas that livestock favor such as gentle rangelands, near water sources, and along low-lying drainage bottoms and swales. All livestock grazing authorizations would have stipulations limiting upland bunchgrass utilization to 50% or less and riparian stubble height stipulations to four or six inches. Typically, in pastures that have riparian resources, the riparian stubble height stipulation requires livestock to be moved before upland utilization thresholds are hit. Regardless these stipulations would be placed on the authorizations to ensure that livestock

use remains at sustainable levels, adequate photosynthetic material remains for plant recovery and maintenance, and other ecological functions are maintained, such as minimizing bare ground, effectively capturing moisture, nutrient cycling, etc. Livestock authorizations would also have the flexibility to be adjusted up to 7 days, as well as modifying the scheduled rotations. This flexibility would allow managers and authorization holders to deal with natural unplanned circumstances such as drought, fire, or water availability issues. These modifications would have to be approved by the BLM before being implemented to ensure that the proposed changes account for resource needs and vegetative physiological requirements. In general, flexibility for the BLM or the authorization holder to modify planned grazing benefits upland sagebrush and grassland habitats by potentially accommodating necessary adjustments to deal with unplanned circumstances.

Under all alternatives noxious and invasive species management would continue to be implemented across the watershed. Noxious and invasive species have the potential to encroach and invade into areas of healthy native rangeland. Additionally, where disturbance has occurred or where native sagebrush or grassland habitats are not fully intact, noxious or invasive weeds may quickly gain a competitive advantage. Continued detection efforts and follow-up treatment would minimize the potential for weed spread into sagebrush and grassland habitat.

Sage grouse habitat would be periodically measured and monitored to ensure that habitat objectives are being met in accordance with the 2015 ARMPA. These objectives were developed based on healthy sagebrush habitat conditions. Therefore by periodically monitoring these areas to measure habitat conditions, managers and specialists will be informed as to whether habitat conditions are being maintained or where habitat conditions are not maintained, site-specific actions would be prioritized to restore healthy sagebrush habitats. Future site-specific actions would require a separate analysis.

Wildfire Management:
Under all alternatives, wildland fires could be managed for ecosystem management with significant constraints. If wildfire was allowed to burn within areas of already high sagebrush canopy cover or within areas of conifer encroachment, sagebrush communities would be transitioned to grassland communities for the short term. Under wildfire conditions, fire severity may be high in these areas. Proper post management actions such as rest from livestock grazing would be required to maximize the potential for vegetative recovery. However over the long term, the disturbance would typically be beneficial to ecological site and plant community function as the wildland fire would restore many of the ecological processes including site specific vegetative composition (functional structural groups) back to reference conditions. In the short term, burned areas would be more vulnerable to infestation from weeds or other non-desirable plant species. In areas where full wildfire suppression is utilized, unburned areas would remain status quo, while areas where surface disturbance occurs (blading fire line) sagebrush and grassland habitat would be impacted. All vegetation along the fire line would be removed. Typically the topsoil would be pulled back following suppression efforts. These sites would be subject to increased wind and potentially water erosion. Herbaceous plants would be the first to recover, however annual grasses, forbs, or other weeds may establish first along these lines, followed by desirable plants in subsequent years. Fire lines would need to be monitored and treated for noxious weed establishment. Seeding of native vegetation may also be required. Shrub establishment along fire lines may take many years.

Non-Commercial Mechanical/Prescribed Fire:
Under all Alternatives Non-Commercial Mechanical/Prescribed fire treatment units approved following the 2007 Red Rock/Lima Watershed Assessment would be brought forward for initial treatment or for re-entry. This includes 2,194 acres within the Bell Canyon, Roe West and Clark Canyon allotments. Site-specific impacts for these treatments are included in Environmental Assessment MT-050-07-069.

Alternative A – No Action

Livestock Grazing:
Under the No Action Alternative no changes to the current livestock grazing authorizations would be made. Currently all upland sagebrush and grasslands met the upland health standard. These conditions would not be expected to change from livestock grazing as discussed under the No Action alternative, with the exception of the Norris Canyon allotment. While all allotments did meet the upland health standard, the Norris Canyon allotment did have site specific concerns related to plant composition and vigor. On this allotment, livestock have been grazed for approximately 10 days every spring. As a result an increaser dominated plant community has developed, and the vigor of cool season bunchgrasses is poor. This community may persist in a static trend or could continue to decline, potentially not meeting upland health standard in the future.

Throughout the watershed, vegetative composition (functional structural groups) were commonly departed either due to elevated levels of shrubs, with a resultant reduction of herbaceous production, or from conifer encroachment into the shrublands. In areas where shrubs have increased, levels would be expected to continue to remain high, and could continue to increase. Habitat Assessment Framework (HAF) data analysis suggests the current levels of shrubs in most areas generally support a healthy herbaceous understory, however as shrubs continue to increase this understory vegetation may began to declined. Future monitoring and HAF analysis as discussed under "Actions Common to All Alternatives" would be necessary to measure the persistence of the understory vegetation. If shrub composition begins to reduce herbaceous understory vegetation, proper treatments would be prioritized subject to additional NEPA analysis.

Conifer encroachment into sagebrush and grasslands continues to be a threat to sagebrush and grassland habitat. Under Alternative A no new treatments are proposed, however treatments previously approved may continue to occur. In the absence of natural disturbance, sagebrush and grassland habitats, especially along forest boundaries will continue to experience conifer encroachment, and will convert to forested habitats over time.

Fire Management:
Under the No Action Alternative the management of naturally occurring wildfire in RRLW would continue as defined in the Dillon RMP and Dillon Fire Management Plan. The watershed is within Fire Management Category C. Within Category C, fire is desired in this area, but with significant constraints that must be considered for its use. Suppression action would be initiated on fires that do not fall within defined parameters in which they may be allowed to burn, or are a threat to public safety or private property.

With the continued expansion of conifers into sagebrush upland and grassland habitats expected under the No Action Alternative, fuel loads would continue to increase. This increase in fuel

loads would also increase burn severity, and suppression costs while decreasing effectiveness of control actions taken by fire managers, should a wildfire event occur.

Effects Common to Action Alternatives

Under the Action Alternatives, water developments are proposed. Water developments have the potential to impact upland grassland and sagebrush habitat. Direct physical loss of habitat within the project footprint would occur. Assuming that troughs would be 10 foot round tanks, this represents ~78.5 ft^2 of direct sagebrush/grassland habitat loss per tank. Any surface disturbance such as pipelines and site leveling would be re-seeded, however these areas would be prone to noxious and invasive species infestations until plant communities become established. These areas would require monitoring for several years to ensure that noxious and invasive species are treated if they appear within the disturbance. Livestock use levels would be expected to increase as a result of the offsite water, therefore sagebrush and grassland habitat would be indirectly impacted through increased livestock use over a larger areas. Assuming that the highest utilization occurs within 0.25 miles of a stock water trough, approximately 125 acres per trough would be subject to increased utilization and potentially indirect impacts to sagebrush and grassland habitat changes. As palatable herbaceous plant species are utilized at a higher rate, these species may experience some declines. Other less desirable species such as sagebrush, rabbitbrush, Sandberg's bluegrass and increaser forbs may increase. The degree of these indirect changes to habitat would depend on a variety of factors such as the grazing system, the season of use, degree of utilization, and the placement and distribution of other water sources. Well designed grazing systems and utilization thresholds would mitigate these indirect impacts and the upland health standard would continue to be achieved, even adjacent to the stock water trough. Additional stock water troughs would also have beneficial impacts to upland sagebrush and grassland habitat across a larger area. If placed in areas of typically lower livestock use, livestock would be drawn to areas where utilization is typically low. By altering livestock use and distribution patterns, areas normally favored by livestock such as primary range and drainage/swale bottoms would be subject to less grazing pressure, and could benefit from additional water sources. Since livestock use is not being increased within the allotments or pastures, the upland utilization thresholds (including the 7" residual vegetation height) is expected to be achieved on a pasture wide basis.

Installation of fencing could also impact sagebrush or grassland habitat. Typically, the direct impact to these habitats from construction is low. Direct impacts would occur mainly only where the fence posts are located, however these structures are intended by design to modify livestock use patterns. Typically livestock will trail along fences. Over time trails and ruts commonly occur adjacent to fences and vegetation in and along these trails may be eliminated. In these trails water may concentrate and flow, causing erosion. The degree to which livestock trail along fences and create ruts depends on a variety of factors, such as soil, slope, type and class of livestock, and grazing management. Grazing systems that typically prescribe longer grazing seasons generally result in more trailing as livestock have more time to search and explore the pastures. Where soils are finer textured trails typically result quicker as these soils are commonly more mobile. Fences have indirect off site impacts to upland sagebrush and grassland habitat. Fences are typically used to better manage the time, duration, and distribution of grazing livestock. As these factors are better managed over a larger area, ecological conditions are expected to improve, therefore the fences can indirectly improve sagebrush and grassland habitat over a larger area.

Wetland and Mesic Restoration:
Under all Action Alternatives, an array of wetland and mesic area restoration treatments would be utilized. Across the Red Rock Lima Watershed, many areas that were historically wetlands, or mesic bottoms have transitioned toward a dryer moisture regime for a host of reasons. As these sites have dried, they have also transitioned away from a facultative wetland/obligate community to grassland or sagebrush habitat. The restoration treatment objectives are designed to spread and hold water longer on the landscape. As this occurs, bottoms that contain sagebrush or grasses may become too moist to support sagebrush or grasses. The plant community may shift toward a facultative or obligate wetland vegetative community. These areas are typically small narrow bands across the landscape. Small areas of sagebrush of grasslands directly within these bottoms may be eliminated overtime. Bottom areas would again function at a higher ecological potential. If plant communities change over time, and there is a resultant increase of palatable plant production, grazing pressure in the sagebrush and grassland habitats adjacent may be slightly reduced.

Non-Commercial Mechanical and Prescribed Fire
Treatments are intended to reduce trees through either mechanical means and/or through prescribed fire. Each of these treatments has the potential to impact sagebrush and grassland habitats. Additionally a treatment units response would also depend on the level of forestation prior to treatment. For example an area in phase I or low phase II conifer encroachment continues to have adequate understory herbaceous production with or without shrubs. The herbaceous component on these sites would respond quicker to treatment methods compared to an area of Phase III conifer encroachment, where the herbaceous and shrub understory has been measurably diminished. Mechanical treatments may preserve the shrub understories if present and may result in an increase of both herbaceous and shrub understories. Mechanical treatments alone would not eliminate all of the smaller conifer seedlings, therefore there is the potential for the positive effects of the treatment to be relatively short lived, as untreated conifers would continue to expand. Prescribed fire treatments would likely result in a loss of most understory shrubs within burned areas immediately following the burn. Herbaceous grasses and forbs would flush the following growing season(s). Over time shrubs would re-enter the treatment area. Lesica et. al. (2007) examined sagebrush recovery rates following prescribed and wildland fire in southwest Montana, and found that mountain big sagebrush canopy cover had made a full recovery within an average of 32 years following fire, and as few as 13 years on some sites. Prescribed fire treatments often have a more thorough kill rate on conifer seedlings compared to mechanical treatments alone, resulting in a more effective treatments over a longer duration. In the short term prescribed fire treatments have the potential to impact sagebrush and grassland habitat. As stated above, the use of fire may eliminate a majority of the sagebrush within the burned area. However, based on Field Office experience, isolated stands or individuals commonly survive within the prescribed treatment units leaving a mosaic of burned and unburned areas within the treatment unit. The use of fire may leave sites vulnerable to infestations from other less desirable plant species. Design features outline in chapter 2 would reduce potential negative impacts such as weed establishment and expansion. Additionally, as there would be a flush of succulent herbaceous forage wildlife and livestock would be drawn to these areas. While livestock would be excluded from burned areas for a minimum of two growing seasons either by closing the pasture or using temporary fence, unauthorized livestock use may occur. Additionally wildlife may make substantial use of newly burned areas. In May 2017, the Dillon Field Office collected utilization data from within the 2015 Cabin Creek

Wildfire in the Timber Creek Allotment. The allotment had been rested from livestock grazing since 2014, therefore all utilization was from wildlife. Utilization within the burned area ranged from 60-64% prior to spring green up. Regardless of the animal making use of the succulent forage, if the forage is not allowed sufficient resources to recover from the fire, the site would be more susceptible to invasive species or other low seral stage plant communities becoming established.

In some cases, such as phase III encroached stands, a series of treatments may be warranted. Commonly in phase III encroachment, tree canopies have reduced understory vegetation production, leaving areas of nearly complete bare ground under tree canopies with little to no herbaceous understory. Mechanical treatments may be necessary to remove the conifer overstory and make resources available for understory herbaceous production to reclaim bare ground. As understory vegetation fills in, and the site is capable of making a quicker recovery from prescribed fire, prescribed fire may then be utilized. Multi-phased treatments may be preferable within phase III conifer encroachment, as they would: 1) Allow for herbaceous understory vegetation to fill in prior to burning. 2) Provide a herbaceous fuel base to effectively carry fire 3) Reduce bare ground at the time of the fire increasing the number of bunchgrass root crowns across at the soil surface to reduce erosion and expedite herbaceous recovery. Over the long term, non-commercial mechanical/prescribed fire treatments would be beneficial to sagebrush steppe and grassland habitat.

Commercial Forest and Woodland Harvest

Treatments have the potential to indirectly improve sagebrush and grassland habitat. As forest canopies are opened up and herbaceous understory production increases, additional forage would be available within the grazing unit. If these resources were accessible to foraging livestock and wildlife, grazing pressure on traditional grassland and sagebrush rangelands would be reduced. Under no alternative would there be an increase in authorized AUM's. Therefore overall grazing pressure across the unit would be reduced on individual plants as more forage would be produced.

Noxious and Invasive Species

Under all action alternatives additional biological weed control agents, and helicopter spraying would be implemented. By utilizing more available resources, weed management is expected to improve, ensuring that weed treatments within sagebrush and grassland habitats have the maximum potential for success.

Alternative B

Livestock Grazing

Under Alternative B, livestock grazing management is being revised on the Snowline AMP, Gallagher, Gallagher Mountain AMP, Norris Canyon, Clark Canyon, Williams, Shoshone Cove and Cedar Creek allotments. For all other allotments, upland sagebrush and grassland conditions are expected to be maintained as discussed under Alternative A (No Action Alternative). Norris Canyon allotment was the only allotment for which management is proposed to be modified for upland sagebrush and grassland habitat alone.

Cedar Creek, Williams, Shoshone Cove: Under the proposed action the season of use would be modified on these three allotments from approximately 5 weeks in May/June two years out of three to dormant season use (November 1- March 30) two years out of three. By eliminating

spring grazing, herbaceous plant vigor is expected to improve throughout the allotments. As the vigor of grasses and forbs increase, bare ground is expected to decline. Additionally as the herbaceous component of these allotments improves, the competitive advantage of shrub species, mainly sagebrush, would be reduced. Sagebrush cover may slightly decline. Alternative B would improve sagebrush and grassland habitat quality, however since these allotments were determined to already be meeting the upland health standard, the degree to which they improve may be low. Under alternative B up to nine previously disturbed sites may be used as water hauling locations (five on Cedar Creek, two on Shoshone Cove, and two on Williams) with the same impacts as discussed under Impacts Common to All Action Alternatives.

Within the Williams, Roe West and Bell Canyon allotments, 1,563 acres would be inter-seeded to improve species composition by increasing the composition of mid-height cool season bunchgrasses. While 1,563 acres are proposed, not all areas would be treated. Treatment would be prioritized based on the success of treatments scheduled for the spring of 2018, and other variables on the ground. The areas proposed for treatment are dominated by short cool season bunchgrass communities, however they have the potential for mid-height bunchgrass communities to dominate. Treatment would occur by broadcasting native grass and forb seed behind a UTV. No surface disturbance would occur. Regularly scheduled livestock grazing would be utilized to incorporate the seed into the soil. If successful, the plant composition would change. The degree to which the composition would change would depend on the efficacy of the project, however an increase of mid-height bunchgrasses and forbs would benefit upland sagebrush and grassland habitat. All seed would be certified weed seed free, to ensure that non native invasive species were not introduced into the treatment areas.

Clark Canyon: Under the proposed action the State/Buck Pasture would be removed from the grazing allotment. This would remove approximately 18 AUM's (154 BLM Acres) from the Clark Canyon allotment and would create a new allotment. Within the new State/Buck Allotment 18 AUM's would be authorized from 3/1-2/28. There would be no change to the upland sagebrush or grassland habitat within the remainder of the Clark Canyon grazing allotment. The 154 acres of BLM managed public land within the State/Buck Allotment would likely continue to receive the same grazing use as has historically been made on it. The pasture is predominately DNRC land, and their grazing fee is considerably higher, so the permittee had been grazing the unit annually during the spring. This trend is expected to continue. This type of use has created an increaser dominated community. Common species include threadleaf sedge (*Carex filifolia)* Sandberg bluegrass (*Poa sandbergii),* and Junegrass (*Koeleria macrantha).* These species are relatively grazing resistant, and use levels and patterns are not expected to change, therefore these communities are expected to persist. These vegetative communities were assessed and found to meet the upland health standard. If use within the pasture changes upland sagebrush and grassland habitat may shift as well.

Gallagher: Under Alternative B, the grazing rotation would be modified to authorize only 29 days of grazing use within the Upper Bill Hill pasture instead of the current 34 days. There would be no change in total use within the allotment. The approximately 5 days of grazing use normally scheduled within the Upper Bill Hill pasture, would be spread across the remaining pastures. Based on past resource and utilization monitoring, harvesting the additional forage in the remaining pastures could be accommodated. In addition, stipulations discussed under Actions Common to All Alternative would ensure that upland utilization and riparian stubble height thresholds continue to be obtained. Sagebrush habitat would continue to be maintained under

Alternative B on the Gallagher Allotment. Within the Gallagher Allotment two new water locations would be developed with impacts discussed under Impacts Common to All Action Alternatives.

Gallagher Mountain AMP: The season of use on the Gallagher Mountain allotment would be deferred for two weeks compared to the No Action alternative. Deferment through the early growing season would provide an additional two weeks of green up for photosynthesis and plant maintenance prior to livestock grazing. Spring deferment is typically beneficial to rangeland condition. The grazing management rotation has been modified under Alternative B. The Warm Springs and Dry Mast pastures would continue to be rested every other year, however rather than being grazed every other spring under the No Action, they would be grazed either in the spring or fall, with spring grazing every fourth year under Alternative B. By reducing spring grazing on these pastures, upland grassland and sagebrush conditions should improve. However, since these pastures are already meeting the upland health standard, the degree to which they improve may be low. Under Alternative B, the remaining pastures would be managed for rest at least every fourth year. Under the No Action Alternative these pastures (except the Clark Canyon pasture) would be rested every third year. Under Alternative B, during years of grazing, the duration of grazing would be limited to not more than 45 days with a target of approximately 30 days. The allotment met the upland health standard and quality grassland and sagebrush habitats are intact, so these changes, along with the scheduled rest and deferment would continue to meet the upland health standard and promote healthy grassland and sagebrush habitat. Within the Gallagher Mountain allotment up to three new water locations would be developed with impacts discussed under Impacts Common to All Action Alternatives.

Norris Canyon: Under Alternative B, the authorization would be modified to require rest every fourth year. By requiring occasional rest, plant performance and vigor should not continue to decline. The limited rest may only maintain conditions; however, conditions are currently meeting the upland health standard. Additionally periodic livestock and wildlife utilization monitoring would increase to determine utilization by wintering wildlife.

Snowline AMP: Under Alternative B, grazing management for fields 6,8,9 would not change. Upland sagebrush and grassland habitat would continue to meet the upland health standard. Fence modification would be completed within the North Dutch Hollow, fields A2, A3, and A4, however the grazing management would remain similar with no expected change to the upland sagebrush habitat. Under Alternative B, grazing management for the Pine Butte pasture would change from a spring, fall, rest rotation to a twice over, fall, rest rotation. The fall use period would be deferred until October, and the duration would be reduced from ~47 days per year when actively grazed to 30 days per year when actively grazed. The number of livestock authorized would increase from 675 to up to 1065. Based on utilization monitoring conducted in the Pine Butte pasture in 2017, upland utilization ranged from 18-25% on key forage plants, however riparian area utilization was much higher. Under Alternative B, the grazing duration would be shortened with a resultant increase in stock density. These changes along with proposed water developments, and utilizing the pasture during cooler times were initiated to draw livestock out of the riparian bottoms to reduce impacts to riparian habitat. Livestock use and distribution into the uplands is expected to increase due to cooler temperatures, less demand for water from livestock, and greener upland vegetation. In addition, livestock may be weaned by the October use period which typically results in increased livestock distribution from water. While increased use of the uplands is expected, current use levels indicate that ample upland

forage exists to accommodate the expected shifts in utilization while still meeting utilization thresholds. The spring green up period is the most critical period for cool season grass development. However if conditions are favorable, fall green up may be an advantageous period for cool season grasses to store necessary energy reserves in the root. Under Alternative B, there would be more fall grazing. However as the fall grazing period would be deferred through the month of September, a majority of the frost free days in which active photosynthesis could occur for energy storage would be limited. In addition, by reducing the duration of spring grazing, there is a high potential that cool season grasses could recover following the spring grazing period because soil moisture would generally be adequate to support some level of regrowth and recovery before summer dormancy. Under Alternative B, increased use of the uplands is expected, however increased fall deferment, shorter grazing periods, and existing utilization thresholds would ensure that upland sagebrush and grassland habitat continues to remain healthy and meet the upland health standard.

Under Alternative B, if riparian conditions do not show improvement after two cycles grazing, use would be reduced within the pasture. Reduced grazing use would continue to maintain or improve upland grassland and shrubland habitat. However because the uplands are currently healthy, improvements to grassland and shrubland habitat may be minor.

Within the Snowline AMP there is a well proposed in the North Dutch Hollow pasture. Reconstruction would occur on a water system between Lima Peaks and the South Dutch Hollow Pasture. Additional tanks would be placed adjacent to two existing tanks in the Pine Butte pasture. Reconstruction would occur on spring #947 in the Pine Butte Pasture, and two new water systems would be installed within the Pine Butte Pasture. Impacts from the water systems are discussed under Impacts Common to All Action Alternatives.

Other Allotments: In addition to the water developments in the allotments listed above, up to two existing spring fed water systems in the Lima Peaks allotment and one existing spring fed water system on the Truax/Lima Peaks allotment would be redeveloped. Additionally one pipeline fed water trough from the Bell Canyon allotment to the North McKnight allotment would be installed. Impacts are discussed under Impacts Common to All Action Alternatives.

Non-Commercial Mechanical/Prescribed Fire:
Under Alternative B, impacts to sagebrush and grassland habitat from non-commercial mechanical/prescribed fire use would occur. Specifically under Alternative B, three new treatments, totaling up to 1,186 acres within the Clark Canyon and Roe West allotments are proposed. These treatments would occur within the Horse Mountain, Clark Canyon 1, and Clark Canyon 2 pastures of the Clark Canyon allotment, and the East or lower pasture of the Roe West allotment.

Forest and Woodland Treatments:
Under Alternative B, up to 1,188 acres of forests and woodlands could be treated within the Clark Canyon Allotment. Impacts to upland sagebrush and grassland communities within the Clark Canyon allotment from forest and woodland treatments would be similar to impacts discussed under Impacts Common to All Action Alternatives.

Mountain Mahogany Treatments:
Mountain mahogany communities typically occupy rock outcrops within sagebrush uplands or along dry Douglas-fir forest ridges. As mountain mahogany requires a niche habitat, and

sagebrush composition within these niche habitats is typically low, treatments within these areas would have little impact to sagebrush habitats. However, treatments designed to limit conifers would be beneficial to sagebrush habitats by reducing shading and competition for resources.

Travel Management:
Under Alternative B, 7 miles of designated routes would be closed to motorized vehicle use and 7.2 miles would be designated open to motorized use yearlong. Some routes that are being closed may be actively reclaimed and others may have passive restoration unless use continues to occur on them. By closing these routes vehicular use would be less widespread across the landscape. Vehicular use would not be expected to decline. As vehicular use would be confined there is less potential for weed transport into areas closed to motorized vehicles. However, often times the public continue to drive on closed routes, or where terrain or closures allows, may drive around closures. In these cases, the potential for weed transport into closed areas would remain and there would be less potential that new infestations in areas of closed roads are found early and treated effectively while infestations are small. Natural reclamation of closed routes to grassland or sagebrush habitat typically does not occur, or if it does would take a very long time due to changes in soil properties, and continued un-authorized motorized use. Where obliteration and planting techniques are used, reclamation potential to grassland or sagebrush habitat would be improved. As these habitats are reclaimed, unauthorized use typically goes down because routes are not as easily observed which would reduce the potential for new weeds infesting these areas. Additionally as bare ground along vehicle tracks declines, there is less area available for new weed establishment if seed is introduced. Seeding and planting on steep routes, such as within the Bell Canyon allotment would, over time, reduce soil erosion.

Alternative C:

Livestock Grazing:
Under alternative C, the only allotment in which livestock grazing would be modified is the Snowline AMP. In fields 6,8,9, North Dutch Hollow and fields A2, A3, and A4 impacts would be the same as Alternative B. Under Alternative C, a fence would be constructed splitting the Pine Butte Pasture into an East Pine Butte and West Pine Butte Pasture. Within the Pine Butte (east and west) Pasture grazing would occur during the same time and rotation as the No Action alternative, however livestock would be restricted to half of the pasture for half of the time. This would reduce the duration of grazing from 47 days per year when grazed to approximately 24 days. As stock would be confined to approximately half of the area, livestock use of the uplands would be expected to increase and forage selection would decline. Additionally each pasture would have either increased deferment or increased recovery time post grazing compared to the No Action Alternative. As a result a slight improvement to the vigor of palatable species is expected. Both increased recovery and increased deferment would be beneficial to individual plant performance. Also, re-grazing of individual plants would be reduced because of the reduced amount of time that livestock have access to the pasture. Utilization data collected during 2017 within the Pine Butte pasture ranged from 18-25%, therefore there is ample upland forage to support increased use and distribution into the uplands from the current level of stocking. Upland sagebrush and grassland habitat would continue to remain healthy and meet the utilization thresholds as well as the upland health standard.

Under Alternative C, if riparian conditions do not show improvement after two cycles, grazing use would be reduced within the pasture. Reduced grazing use would continue to maintain or

improve upland grassland and shrub land habitat. However, since the uplands are currently healthy, improvements to grassland and shrubland habitat may be minor.

Non-Commercial Mechanical/Prescribed Fire:
Impacts would be the same as Impacts under Alternative B, however one additional unit, Limkiln 3 is proposed. This would increase the total treatment acres to 1,913 acres. The Limekiln 3 treatment unit is in both the Bell Canyon and Roe West allotments.

Alternative D:

Under Alternative D, livestock would not be permitted in the Pine Butte Pasture of the Snowline grazing allotment. The authorized AUMs would be reduced to account for the loss of forage available to livestock grazing. These AUMs would be moved to suspended non-use on the Term Grazing Permit. No changes to upland sagebrush or grassland habitat would occur in fields 6,8,9, fields A2,A3,A4, or the Dutch Hollow Pastures. Elimination of livestock grazing in the Pine Butte pasture would result in maintaining or improving healthy upland sagebrush and grassland habitat. As these habitats are already healthy, improvements may be minor. By eliminating livestock grazing from the pasture, herbaceous species vigor would increase, specifically near water sources and in primary range. There may be small shifts in plant community composition because of the increased vigor of herbaceous species, potentially reducing some of the shrub cover over time.

Cumulative Effects

The BLM has consulted with the local Montana DNRC lands office as well as the USFS Beaverhead-Deerlodge National Forest. The USFS is not aware of any pending application or future actions on their agency managed lands within or near the Red Rock Lima Watershed that would impact sagebrush or grassland habitat. The Montana DNRC is proposing two conifer removal projects within the RRLW on DNRC lands. Treatments proposed include DNRC lands in the Snowline area, not within a BLM allotment, as well as within the Bell Canyon Allotment. Due to the relatively small size of the proposed treatments, and location of these treatments these actions along with any of the actions proposed by BLM in this EA would not have a cumulatively significant impact to the overall health of upland sagebrush and grassland habitat within the RRLW Sagebrush and grassland habitats throughout the watershed will continue to experience threats from actions on private property, such a sagebrush control. These actions have recently occurred within the watershed, and are expected to continue at localized scales. Conversion of sagebrush and grassland habitat to irrigated production is not expected to increase on private lands, as most private lands capable of irrigation or crop production are already being irrigated or are in crop production. The remaining lands are likely not economically feasible for conversion. These threats to sagebrush habitat were taken into consideration, and provided some of the rationale for not treating sagebrush expansion on BLM managed public lands. Currently all sagebrush and grassland habitats on BLM managed public lands within the RRLW meet upland health standards. However altered vegetative composition (functional structural groups) such as increasing shrub cover, and continued conifer encroachment will continue to be a threat to upland sagebrush and grassland habitat. Site specific conifer expansion treatments are being proposed to maintain and enhance sagebrush and grassland habitats. These treatments would be implemented in conjunction with treatment previously analyzed and approved in the 2008 RRLW EA. Therefore in the absence of a largescale wildfire, sagebrush canopy cover would likely be maintained over most areas. In these areas the vegetative communities would continue

to be departed from reference conditions. The exception to this would be on allotments where reduced spring grazing is being proposed such as the Cedar Creek, Shoshone Cove, Williams Allotment. Dillon Field Office trend monitoring data has shown decreasing sagebrush canopy cover over time by changing the season of livestock use to dormant periods from spring grazing periods. In these areas vegetative communities are transitioning towards reference conditions. Current analysis indicates that across most areas the herbaceous understory continues to be intact. These areas would be periodically monitored to measure understory vegetation. In the event of wildfire, sagebrush habitats could transition to grassland habitats for the short term. Additionally where conifer encroachment is occurring, wildfire and/or prescribed fire (within non-commercial mechanical/ prescribed fire treatment units), grassland and shrubland habitats would be maintained or enhanced as conifer encroachment would be minimized or removed. Conifer encroachment is expected to continue in montane sagebrush steppe habitat across the watershed in the absence of wildfire or planned treatments.

Resource Issue #3: Forest and Woodland Habitat Environmental Effects

Effects common to All Alternatives:

Public use of wood products on BLM administered lands would result in the removal of dead/dying materials within 300 feet of existing designated open routes. Impacts of personal-use firewood gathering along with public use of wood products on BLM administered lands would result in the removal of dead/dying materials within 300 feet of existing designated open routes. Impacts of personal-use firewood gathering would be minimal. Slashing stipulations may be required in addition to the existing stipulations and regulations required by the permit. Prescribed burning of slash piles may be required to reduce slash concentrations in areas of frequent use.

Permits for Christmas trees would be issued for the removal of small size-class trees. Impacts to resources from Christmas tree harvesting would be minimal. On a very small scale, the removal of these smaller trees would make progress towards meeting management objectives to maintain existing openings by removing young conifers that are expanding into sagebrush/grassland habitats.

Throughout the RRLW, 5-needled pines (limber pine and whitebark pine) will continue to decline due to mountain pine beetle and/or white pine blister rust and may become nonexistent in some areas. Management strategies to reduce white pine blister rust are cost and labor intensive (Hagle et al, 1989). Information on treatment methods shown to effectively promote limber pine and reduce mortality from white pine blister rust are very limited (Schoettle, 2004). Individual and/or groups of 5-needled pines (limber and whitebark pines) that are suspected to be blister rust resistant can be protected from bark beetle infestation where pheromones are applied.

Collecting cones from individual five needle pine trees (limber and/or whitebark pine) that are suspected of being blister rust resistant would contribute to the genetic breeding program, and could help the long-term presence of these species on the landscape. Applying pheromones to selected areas would deter bark beetles from attacking mature trees. This would protect special value individual trees, as well as their genetics, to persist on the landscape as an important feature of forest and woodland habitats.

Douglas-fir and Engelmann spruce will continue to be defoliated and damaged due to western spruce budworm across all ownerships. Heavy defoliation will weaken the host trees and thus predispose stands to future Douglas-fir beetle infestations. Late seral stands will continue to be lost as a result of drought, defoliation, and bark beetle infestation. Current Douglas-fir beetle activity is at endemic levels, but is likely to increase due to suitable stand conditions in certain areas of the RRLW. In the absence of wildfire, conifer expansion into sagebrush communities and aspen will continue across all ownerships.

Aspen communities that are experiencing a decline in extent and vigor will continue on this path. With a lack of disturbance to help sprouting and regeneration, and heavy levels of ungulate browse, aspen communities will likely decline.

Alternative A – No Action

Under the No Action Alternative, forest and woodland stands would not have treatments as proposed in the action alternatives. Current conditions and forest trends would continue until interrupted by natural events such as wildfire, windthrow, insects and disease, and/or changes in weather or climate. Fuel loading as a result of insect/disease-killed conifers would increase at a natural rate.

The density, structure and species composition of forest stands would continue to be departed from historic conditions. Douglas-fir and mixed conifer stands would progress with continued infestations from both the western spruce budworm and Douglas-fir beetle. Continuation of spruce budworm activity would result in additional defoliation, reduced growth and increased susceptibility to attack by other insects including bark beetles. Repeated defoliation by spruce budworm may result in top-killing and tree mortality (Fellin and Dewey, 1986). The sustained defoliation, in combination with suitable stand conditions, may cause Douglas-fir beetle activity to increase, and in some areas this component of live mature Douglas-fir may be lost. The continued epidemic of spruce budworm in the RRLW would allow for "natural" thinning of the Douglas-fir and spruce forest which would reduce densities towards more historic stocking levels, however this may also contribute to higher levels of fuel wood on the forest floor, thus potentially increasing the severity of wildfire. Defoliation and mortality from insects and/or disease would result in decreased canopy cover, increased fuel loading, reduced forest health, and the potential for more severe impacts from wildland fire.

Under the No Action Alternative, aspen would continue to decline due to conifer expansion, competition for resources when intermixed with conifer species, and high levels of ungulate browse. Without disturbances that would favor new regeneration, it would likely become nonexistent in some areas.

Mature pine (limber, lodgepole, and whitebark) trees will continue to be killed by mountain pine beetle. "Mountain pine beetle epidemics can substantially alter the ecosystem by reducing crown, thermal, and hiding cover, increasing forage production, releasing or converting to other tree species, creating large amounts of dead trees and logs, limiting access for large ungulates and recreationists, increasing fire danger, and providing a different mix of habitats for a variety of animal species" (Worrall, 2000). Where lodgepole pine trees have died in and around aspen stands, aspen are expected to benefit through increased vigor due to increased sunlight, water, and nutrients. The vigor, condition and health of understory plants would also improve with increased light, moisture, and nutrients.

White pine blister rust, which is the biggest threat to both limber and whitbark pine, would continue to cause mortality regionally. Excessive mortality of limber pine habitats may cause a shift of species present to Douglas-fir and/or juniper. Whitebark pine habitats are at high risk of loss due to extensive mortality and lack of disturbance required for the promotion of successful regeneration. In the event of large die offs, whitebark pine stands could be replaced by subalpine fir, or may remain bare due to the harsh environment where this species is found. Further losses of whitebark pine would also reduce the snow holding capacities in high elevation sites where it is found (Tomback et al, 2001).

Effects Common to Action Alternatives

The RRLW is comprised of 46,143 forested acres across all ownerships, and 7,290 forested acres of BLM-administered lands. Commercial harvest treatments proposed include up to 1,188 acres (Alt B), roughly 2.6%, and 16% of the total and BLM-administered forested acres (respectively) in the RRLW. Commercial harvesting would reduce the potential severity of wildfire and the associated risk of excessive erosion and runoff rates within and adjacent to the treated areas. Groundwater infiltration would be improved as forest canopy is opened, reducing losses due to evapotranspiration. Removal of dead trees would allow for new trees to establish more rapidly and would increase herbaceous understory within forest and woodland habitat treatment areas. There may be a short-term increase in soil erosion within treated areas, but the long term effect would be decreased soil erosion due to a higher composition of herbaceous vegetation cover. The BLM does not intend to increase authorized livestock use as a result of increased herbaceous vegetation.

The use of temporary roads and/or skid trails to complete harvest activities would result in localized soil compaction within treatment areas. Design features for road construction and maintenance would be followed in accordance with State of Montana Best Management Practices (BMPs) and Streamside Management Zone Law and Rules (SMZs). Roads would be constructed to a minimum standard necessary for the removal of products and safe travel operations. Standard timber sale contract provisions address protection from erosion, sedimentation, and soil compaction and would minimize these impacts with active sale administration. Limiting operations to frozen or reasonably dry road conditions would eliminate rutting greater than six inches deep. Preventive maintenance at the end of each hauling season would decrease the potential for erosion and sedimentation associated with road construction. Closure and recontouring of temporary roads when operations have completed would result in no net increase in road densities within the DFO.

Disturbances within treatment areas have the potential to facilitate the spread and/or introduction of noxious and invasive species. Weed monitoring/treatment would be ongoing during the period of use of temporary roads. The contractual requirement to pressure wash equipment prior to entering the project area, as well as completing noxious weed monitoring and treatment for a minimum of three years post-harvest, would mitigate the potential for noxious weed spread into or within the watershed.

Treatments would result in short term effects to vegetation which would diminish as vegetation responds to new conditions. Commercial harvest and salvage would decrease intra-stand competition on the areas treated and would increase moisture available for residual vegetation due to the change in forest structure. Snow and rainfall interception would be decreased which would result in an increase in infiltration and possible runoff.

Post-harvest stands would have increased availability of water and nutrients due to decreased competition, which would improve tree vigor and future stand resilience to insects and/or disease.

Where aspen are found within stands identified for treatment, the amount of sunlight available to the aspen would increase post-harvest. Understory vegetation within the aspen stands would also increase. The removal of conifers from within and around aspen stands and the use of prescribed fire would revitalize these stands. The placement of slash and other non-merchantable material within and or around these aspen stands would help protect aspen regeneration from browsing on a localized basis. Ground based yarding would further enhance aspen regeneration response by disturbing the aspen root system and promoting sprouting.

The use of prescribed fire within treatment units post-harvest may be utilized to reduce residual dead/down fuel loading to between 5 to 20 tons per acre. Slash loading in excess of residual target may be broadcast burned or piled and burned. If aspen are present within treatment units, prescribed fire may also be used to promote suckering and clone expansion.

Timing of slash disposal post-harvest varies from less than one, up to several summer seasons. During this time, potential fire severity and/or intensity are increased. Proposed treatments would reduce long term fuel loading to resemble levels similar to historical conditions in areas treated. The net effect would be a decrease in intensity and rates of spread of wildfire within the treated area. Reducing fuels would improve the effectiveness of wildfire suppression efforts in the treated areas. Removal of standing dead trees would reduce material that could be recycled by fire and/or biological breakdown, as well as some of the small mammal habitat. However, the removal of standing dead trees would also reduce the potential for soil impacts that could occur in the event of a wildfire during the summer fire season due to the exceptionally high fuel loading.

Whether or not sub-merchantable materials are removed for biomass utilization, the stipulation to retain 5 to 20 tons of dead/down woody debris per acre would be sufficient for long-term nutrient recycling and small mammal habitat. The larger remaining slash material (generally 3" and greater) following prescribed burning would create microsites of shading and moisture retention. The action alternative would make progress toward fulfilling goals and actions of the Forest and Woodland Vegetation and Forest Products section in the 2006 Dillon RMP as amended.

Implementation of proposed harvests would make progress towards meeting management objectives identified in the *Pollinator-Friendly Best Management Practices for Federal Lands* by creating openings in the canopies. Pollinator friendly plants would then be able to re-establish as a component in the understory vegetation that had been shaded out previously.

Planting 5-needle pine seedlings would promote a new cohort of 5-needle pines in areas where acceptable levels of natural regeneration establishment are not occurring (i.e. post wildfire, insect & disease outbreak). Selective cutting of standing dead material around areas with existing natural regeneration would result in higher down woody debris locally, but would not exceed the 5-20 tons per acre. This would also protect establishing seedlings from being trampled by livestock and/or wildlife.

Conditions in forest and woodland habitats not proposed for treatment under the action alternatives would undergo effects similar to those described under the No Action Alternative.

Alternative B

Up to 1,188 acres of commercial and/or non-commercial timber harvest in Clark Canyon would be implemented in the RRLW. Reducing stand density would decrease intra-stand competition and increase the availability of water and nutrients for the remaining trees, increasing residual stand vigor. As trees susceptible to Douglas-fir bark beetle are removed and environmental conditions improve, resilience to insect populations would increase. Selective thinning and patch cutting with retention patches of uncut timber would increase structural diversity in the Clark Canyon area. Small clear cuts of less than five acres would provide for more forage opportunity for elk and deer. Creating breaks in continuous stands would decrease the potential for widespread stand replacing wildfire and would enhance suppression opportunities. Follow up prescribed fire treatments would reduce fuels and recycle nutrients from the mechanical treatments.

The removal of conifers from within and around aspen stands followed by prescribed fire would promote regeneration and revitalize these stands. The use of prescribed fire is to regenerate aspen and willow, which would improve habitat for deer, elk, moose and other riparian obligate species.

Ground based yarding would further enhance aspen regeneration response by disturbing the aspen root system and promoting sprouting. Helicopter yarding would have no additional beneficial effect upon aspen regeneration response except by removal of conifer competition. The use of cable and helicopter harvest would greatly reduce ground disturbance. Using the design features (listed above) in project layout would identify exclusion areas.

Allowing up to 7.25 miles of temporary road construction, and the use of mechanized equipment would cause soil disturbance, and has the potential to introduce or spread noxious and invasive weeds. Design features which require power washing equipment before being used off-road, along with monitoring and treating weeds if found, would reduce the likelihood of noxious and invasive species becoming established or getting spread as a result of this activity. Roads constructed for treatments would be minimally constructed, and would only be used for the life of the contract. Upon completion, all temporary roads would be re-contoured/reclaimed and may also be physically closed with berms and/or slash material to preclude vehicle use following harvest activity. Temporary roads and skid trails would also be re-seeded with native vegetation upon completion. Additionally, adherence to standard timber sale contract provisions, which provide protection from erosion, sedimentation, and soil compaction, would be required. These design features would reduce the potential for erosion and future spread of weeds by vehicles.

The installation of up to 9 temporary crossings would result in minor sediment inputs to the streams during the process of installation and removal. By acquiring and adhering to all applicable State and Federal Permits required for the installations of temporary stream crossings within the project area, appropriate mitigation measures would be taken to ensure minimal impacts from this activity.

Cumulative Effects

Forest health treatments completed on BLM-administered lands, and other ownerships, would increase the diversity of forest structure and composition throughout the RRLW. This increase in structural diversity across the landscape would likely result in a more patchy spruce budworm outbreak regime in the future (Swetnam and Lynch, 1989). Treatment in lodgepole pine to remove bark beetle infested trees and promote regeneration of a new stand would result in patches of lodgepole pine across the landscape that would be resistant to mountain pine beetle for up to 80 years (Mata et al, 2003). Increasing structural and compositional diversity across the landscape as a result of forest and mechanical treatments decreases the probability of large-scale disturbances that produces widespread negative impacts. Large-scale disturbances would still have the potential to occur; however, areas treated would create buffers of less susceptible (in terms of insects/disease) and more fire resilient habitats.

Insect and disease mortality would continue unmitigated in untreated forest stands within the watershed. Proposed treatments would result in an increase in the short term and long term diversity of seral stages and age class distributions of forested habitats on BLM administered lands in the RRLW. Creating breaks in continuous stands would decrease the potential for widespread stand replacing wildfires and enhance suppression opportunities. Implementing treatments which increase structural diversity of forest types would decrease the potential for large-scale epidemic infestations. Salvage and thinning treatments on the BLM alone would have limited effect on the current bark beetle populations because the majority of activity is occurring adjacent to BLM administered lands on the Forest Service. However, where treatments have been completed, residual stands are expected to be more resilient to future insect and disease outbreaks. Wildfires would continue to occur, but in treated areas the intensity would be reduced due to the lesser amount of fuel that would be available. The treatments on BLM administered land would increase diversity at the landscape level within the watershed.
Mitigation and Residual Effects

Design features outlined in Features Common to All Alternatives were designed to mitigate impacts to resources associated with proposed commercial harvest. Under Alternative B, Up to 1,188 acres of commercial harvest would be implemented within the RRLW. Salvage harvest of lodgepole pine would remove mountain pine beetle infested dead and dying trees, allowing sunlight to reach the forest floor. When a new cohort of lodgepole pine trees becomes established, it would form a new age class that would not be susceptible to mountain pine beetle for the next 40 to 80 years. Thinning trees in mixed conifer and Douglas-fir stands would open up the stands and increase the vigor of leave trees. Douglas-fir beetle and spruce budworm hazard would be reduced. The residual stand would be more likely to survive future attacks by insects, and would exhibit less mortality than untreated areas during epidemic insect populations. These effects would occur only within the acres identified for treatment.

Allowing up to 7.25 miles of road construction, and the use of mechanized equipment has potential to cause soil disturbance, and introduce or spread noxious and invasive weeds. Design features which require power washing equipment before being used off-road, along with monitoring and treating weeds if found, would reduce the likelihood of noxious and invasive species becoming established or getting spread as a result of this activity. Roads constructed for treatments would be minimally constructed, and would be re-contoured/reclaimed and physically closed to preclude vehicle use following harvest activity. Additionally, adherence to standard timber sale contract provisions, which provide protection from erosion, sedimentation, and soil

compaction, would be required. These design features would reduce the potential for erosion and future spread of weeds by vehicles.

The installation of up to 9 temporary crossings would result in minor sediment inputs to the streams during the process of installation and removal. By acquiring and adhering to all applicable State and Federal Permits required for the installations of temporary stream crossings within the project area, appropriate mitigation measures would be taken to ensure minimal impacts from this activity.

The loss of whitebark pine habitat has landscape-level ecological consequences, including decline of biodiversity, alteration of successional pathways, changes in distribution of subalpine vegetation, and increased rates of snowmelt in high elevation areas (Tomback et al, 2001). This could also affect bear, rodent, Clark's nutcracker, and other bird species' as this food source declines.

The loss of forest canopy and cover, due to insect and disease mortality, is likely to continue across all ownerships in untreated forested habitat resulting in the accompanying loss of wildlife habitat. Large-scale mortality of trees across forested portions of all ownerships within the RRLW may increase annual stream flows and change the timing of water delivery, due to decreased water uptake by trees and reduced interception of precipitation resulting from the loss of canopy (Colorado State Forest Service, 2009).

Large amounts of large woody debris are expected in and along riparian reaches in forested habitat as dead and dying trees fall. These reaches are primarily steep, narrow valley types (A channels). This would reduce or eliminate both big game and livestock access along these reaches which would reduce or eliminate any impacts from grazing along these reaches and increase use proportionately on adjacent accessible reaches. Increased woody debris in these stream reaches would increase step pool habitat and sediment storage along these areas. Fire hazard is increased in beetle kill areas and with the additional fuel loading these steep, narrow valleys would burn more intensely. Sediment storage would be released very rapidly in the event of a wildfire causing excessive sediment deposition lower in the stream system.

Resource Concern #1: Special Status Species and Big Game Habitat Environmental Effects

Effects Common to All Alternatives:

A summary table and a detailed discussion of predicted effects and potential impacts to special status plants and their habitat is provided in the Biological Evaluation (BE) for Special Status Plants on the BLM administered lands within the RRLW (see Appendix D). See Appendix C for the Biological Evaluation for Special Status Fish and Wildlife Species.

Herbaceous forage and cover would be reduced over winter and early spring on allotments that are grazed by livestock in the fall and winter. However, removing decadent herbaceous foliage late in the season would improve the nutritional value and forage quality of grasses for wildlife the following spring. On allotments with big game winter range that are grazed following the cool season bunchgrass growing season, herbaceous forage may be reduced for wintering big game, however plants would not be grazed by livestock during the growing season and therefore able to complete reproduction and enter dormancy. Research has found that growth of grasses

and forbs may be stimulated with livestock grazing later in the growing season if standing dead vegetation is removed. However, low grazing levels had a minimal effect and did not vary with the timing of grazing and grazing effects can depend on local vegetation productivity. High vegetation productivity sites had adequate time for plant regrowth, resulting in greater production when intermediate grazing levels occurred early in the growing season compared to later season grazing (Hanser et al., 2018). Mule deer are intermediate feeders, eating about equal proportions of woody browse and herbaceous forbs. In the winter mule deer depend on browse, especially big sagebrush and mountain mahogany. Sagebrush is also important forage for pronghorn, especially during the winter. Elk and cattle have more dietary overlap, consuming more herbaceous and forb species, as well as browse. Likewise, on allotments that are grazed in the spring and summer, herbaceous nesting cover may be reduced for sage grouse and migratory birds. However, in both cases with big game winter range and nesting cover, a 50% annual utilization threshold is intended to provide adequate residual forage and cover for wildlife, as well as maintain or improve rangeland condition. Various migratory birds have different requirements for foraging and nesting, with some species nesting in shrubs and bunchgrasses while others nest on the ground, preferring more open habitat. Habitat heterogeneity across the landscape accommodates the numerous species' needs.

After accounting for plant phenology and timing of sampling, recent research has shown no difference in grass height between successful and failed sage grouse nests, and that previous research that did show a positive association between grass height and nest success was biased and not indicative of effect of concealing cover on detectability by predators (Gibson et al, 2016; Smith et al. 2018). Previous research measured grass heights following nest failure or hatch, resulting in hatched nests being measured later in the season than failed nests, giving grasses more time to grow, inflating the statistical relationships between grass height and nest survival (Smith et al. 2018). No difference in grass height between successful and failed nests across datasets compared for this research suggests that grass height was not a limiting resource. It is now suggested that grass height be measured at all nests after the predicted hatch date to remove this bias. The recent research points out that grass height greatly fluctuates from year to year with weather conditions, and ecological site potentials vary, making it an inaccurate metric for management decisions (SGI, 2017). Smith et al. (2018) assert that there is little evidence that there is a causal relationship between grass height and nest survival, and warn that while herbaceous understory is a key component of sage grouse habitat, that its role in nest concealment from predators is overstated in management guidelines, including the HAF. They advise that the more persistent threats to sagebrush habitat, including conifer encroachment, which are shown to reduce sage grouse populations, should be the highest priority for land managers, rather than maintenance of tall grasses and forbs for nesting cover. Gibson et al. (2016) share this same sentiment in that conservation plans are often not adequately funded and "*resources toward management objectives based on a habitat metric that has not reliably been demonstrated to improve reproductive performance has additional consequences as it reduces the amount of resources available for more meaningful restoration efforts*". Hagen et al. (2007) found that estimates of nest and brood area vegetation variables were consistent with published guidelines for sage grouse management, including greater sagebrush cover and grass height at nest sites and greater forb and grass cover with less sagebrush cover in brood areas. Although grass height is included as an indicator in the ARMPA and HAF sage grouse habitat objectives, no single indicator from the habitat objectives table is to be used by itself to determine site-scale suitability of sage grouse habitat and not all areas within a given habitat management area will be

capable of meeting the desired seasonal habitat values due to variation in vegetation communities and ecological potential (USDI, 2017).

Smith et al. (2017) suggest that grazing management likely has a minor effect on sage grouse nest survival compared to factors such as weather and predators, and nest survival rates are unlikely to be limiting population growth in their Central Montana study area. In the DFO, sagebrush is a major contributor to nesting cover. A review of published research found that livestock nest trampling is possible, however it's probably uncommon on sagebrush grassland habitats, compared to grasslands without sagebrush cover (Schultz, 2009). Balph et al. (1989) documented that the elevation of vegetation was the visual cue that cattle use to choose hoof placement, avoiding taller vegetation. This suggests that birds nesting beneath shrub canopy or in the crown of bunchgrasses have a low probability of being trampled if livestock stocking rates are not unacceptably high (Schultz, 2009). Incorporating rest and deferred seasonal use outside of the nesting season and bunchgrass growing season at least every couple years would improve plant vigor, benefiting nesting habitat and forage availability. Livestock tend to graze certain areas more regularly than other areas within an allotment, leading to more patchy grazing, which can increase forb availability and stimulate forb growth in uplands (Adams et al., 2004). Light to moderate cattle grazing or managed grazing systems can improve quantity and quality of summer forage (i.e. forbs) for sage grouse (MFWP, 2005). Although spring livestock grazing increases potential disturbance to nesting birds, impacts would be minimal to individuals and habitat, without contributing to a loss of viability to the population or species.

Continuation of lek monitoring within the RRLW would contribute to long-term population trend data for male sage grouse lek attendance. Marking fences and exclosures to make them more visible in areas where sage grouse use may be more concentrated would reduce collisions with wires. Conifer expansion into sagebrush habitat was noted in the watershed. This expansion has reduced and will continue to reduce habitat for sagebrush dependent species, especially where we are unable to treat conifer expansion. High sagebrush canopy cover was also documented in a couple of allotments. Since sage grouse and other wildlife continue to use these areas, and herbaceous understory meets HAF objectives, these areas were considered but eliminated for treatment at this time (see Chapter 2, Alternatives Considered but Eliminated from Detailed Analysis). The DFO will continue to implement habitat guidelines from the ARMP (USDI, 2015) to maintain and enhance sage grouse habitat in the RRLW. Ecological site potential, high sagebrush canopy cover, and conifer expansion would continue to create sites that are outside of these habitat objectives. Implementing these habitat guidelines and conifer expansion treatments would also provide vegetative composition and structure for sagebrush obligate species to fulfill all or part of their life cycle.

West Nile Virus has not been documented in the area administered by the Dillon Field Office. Management to reduce impacts of WNV focuses on eliminating man-made water sources that support breeding mosquitoes known to vector the virus. Whether the water development is for livestock water, wildlife habitat, fish, or storm water management, potential habitat for mosquitoes may be increased. Incorporating applicable design and mitigation measures, described in Appendix C of the ARMP (USDI, 2015), for water development projects can reduce mosquito production through modifying and eliminating mosquito breeding sites.

Treating noxious weeds would reduce their potential to dominate a site, retaining native vegetation for wildlife cover and forage. Improving whitebark and limber pine, including

contributing whitebark pine cones to the genetic restoration program, would promote this habitat and their seeds, which are an important food source for wildlife species, such as squirrels, Clark's nutcrackers, and bears.

Maintenance to remove the remaining small juniper along riparian areas would extend the opportunity for deciduous riparian vegetation canopy cover to increase, which would also increase riparian associated and obligate species' habitat. This would enhance forage and cover for species such as veery, warbling vireo, and dusky flycatcher.

There is potential for conflicts between livestock and large carnivores, especially when livestock are calving or have young offspring. Although grizzly bears have not been confirmed in the RRLW, amending grazing authorizations to state that livestock losses may occur from wolves and grizzly bear would create awareness, and minimize conflicts between lessees and agencies responsible for managing the predator population. Notification by the permittee to the BLM, MT FWP, or Wildlife Services as soon as is practical of any grizzly bear depredation on livestock or conflicts between grizzly bears and livestock, even if the conflict does not result in the loss of livestock, would likely reduce the chance of livestock depredation and the possible removal of the grizzly bear. Encouraging food storage recommendations would also reduce conflicts between bears and public land users.

Removing, modifying, or rebuilding BLM fences and fences bordering BLM lands to standards outlined in BLM Fencing Handbook H-1741-1 (USDI, 1989), would enhance wildlife and bird movement through the area and reduce entanglement and collision hazards. Modifications would be made to existing fences not meeting BLM specifications, which would reduce barriers to wildlife movement and mortality. Modification of wildlife barrier fences would improve seasonal movements by elk, mule deer, moose and antelope in specific areas within the watershed, particularly for young of all species. Adjusting wire spacing, removing wires or providing gaps would allow animals to pass over or under these fences with a reduced risk of entanglement. Installing wildlife escape ramps in water developments enhances the ability of birds, bats, and other small mammals to get out of water developments and avoid drowning.

Alternative A – No Action

Under the No Action alternative, wildlife habitat in allotments that did not meet riparian/wetland and water quality standards would continue to be affected by reduced vegetative and woody cover, vegetative species composition, and structural diversity. Decreased aspen, willow and sedge dominated communities limit biodiversity by reducing habitat available for fish, amphibians, migratory birds, nesting waterfowl, and browse for wild ungulates. The quality and quantity of sage grouse brood rearing habitat may be reduced, particularly on the allotments surrounding sage grouse leks in the Snowline area, where riparian standards were not being met and existing trends would continue.

Suitable sagebrush habitat exists for sagebrush obligate species throughout RRLW, however conifer expansion into sagebrush/grassland habitat would convert many of these sites into forest or woodland cover types. This would continue to reduce habitat for sagebrush obligate species including sage grouse, pygmy rabbit, Brewer's sparrow, sagebrush sparrow, and sage thrasher. Elk and mule deer winter range, and moose habitat would also transition into forest in certain locations. This would reduce big game forage and browse such as bluebunch wheatgrass, sagebrush, mountain mahogany, and deciduous riparian shrubs and trees.

Continuation of current grazing practices on the Norris Canyon allotment would result in a continued suppression of plant composition and vigor, including forbs and cool-season bunchgrasses which would likely limit plant cover and forage for ground nesting birds, wintering big game and small mammals.

Effects Common to Action Alternatives

Construction of new fences may impede movement and be an entanglement and collision hazard for wildlife. Following BLM Handbook H-1741-1 specifications for constructing wildlife friendly fences and livestock exclosures would reduce the risks to birds, elk, mule deer, antelope, and moose. Marking new fences with a high risk of collision would increase visibility for sage grouse and other wildlife, reducing the risk for collisions with the wires.

Planting whitebark pine and/or limber pine seeds or seedlings, cutting competing conifers around healthy whitebark/limber pine trees, and hand felling dead trees around whitebark/limber pine trees would promote this habitat, increase resources available to healthy trees, and protect them from trampling. Enhancing whitebark and limber pine habitats provides seeds for birds including Clark's nutcrackers, small mammals, and bears. It also provide nesting, thermal, and hiding cover for wildlife.

Treating noxious weeds reduces their potential to dominate a site, increasing and retaining native vegetation for wildlife cover and forage. To reduce impacts to special status species and migratory bird nesting, aerial spraying of noxious weeds would only be completed after sites have been inventoried and applicable timing stipulations have been applied.

Restoring riparian health is expected to have a beneficial impact on wildlife and fisheries habitat by increasing forage and thermal, nesting, and hiding cover as well as reducing sediment input into streams. Forbs are an important summer food source for sage grouse broods. Later in the summer, as palatability of forbs declines, sage grouse move into moist areas that still support succulent vegetation, including wetland and riparian areas. Revising livestock grazing to improve riparian conditions, building exclosures around springs and sections of riparian reaches, developing water troughs off of springs and riparian areas, as well as implementing the riparian, wetland, and aquatic habitat enhancement or restoration projects, would benefit all wildlife species that utilize riparian habitats. This is especially true for sage grouse during brood-rearing when forbs and insects are essential to their diet. If ground disturbance associated with the restoration projects occurs between December 1st and April 30th on big game winter range, the project sites are fairly isolated, short duration, and small scale in relation to available winter range, making impacts to wintering big game unlikely and minimal.

Design features outlined in Chapter 2, under Features Common to All Action Alternatives, for commercial timber harvest were designed to mitigate impacts to all resources, including wildlife. Timing of treatments would be coordinated between the forester and wildlife biologist to minimize conflicts with wildlife. If warranted, seasonal timing restrictions may be specified in treatment contracts/and or burn plans. Since the commercial harvest units are within frequently used elk, mule deer, and moose winter range, harvest should not occur from December 1 through May 15. Raptor surveys would be completed in the harvest units, and any nests would be buffered and preserved during operations and timing restrictions would be imposed to reduce disturbance during the breeding/nesting season. Including food storage stipulations in timber harvest contracts would reduce potential conflicts with bears.

Reducing conifer encroachment, including prioritization of mechanical removal of conifers within up to three kilometers (1.86 miles) of occupied sage grouse leks is an objective listed in the ARMPA (pgs 2-4, 2-16, and 2-18). As is also listed as a management decision in the ARMPA, conifer encroachment treatments identified in alternatives B and C of this EA have been *designed through an interdisciplinary process to expand, enhance, maintain, and protect sage grouse habitat, considering a full range of cost effective fuel reduction techniques including mechanical and prescribed fire treatments* (USDI, 2015, pg 2-21). Coordination with Montana Fish, Wildlife and Parks wildlife biologists has occurred throughout the assessment and NEPA process and will continue to occur throughout implementation. None of the proposed mechanical/prescribed fire units are within a sage grouse priority habitat management area (PHMA) and are not near any sage grouse leks. The units along the eastern Tendoy range and a portion of a unit in Clark Canyon are within a sage grouse general habitat management area (GHMA).

Sagebrush is an important habitat component for sage grouse. It comprises nearly 100% of sage grouse winter diets and provides thermal, hiding, and nesting cover. Sagebrush grassland habitat would be restored in the long-term in areas where prescribed fire and/or mechanical methods are utilized to reduce conifer expansion in sagebrush habitat. An increase in forb production associated with these treatments would provide for sage grouse foraging, essential during brood-rearing. An increase in big game use is also expected within the units after the burn treatments during green up and winter range forage would be improved as well. Reducing conifer expansion in elk and mule deer winter range would prevent conversion to forest habitat and retain sagebrush/grassland in the long-term. As noted by Thomas and Toweill (1982), elk primarily eat grass on winter ranges in areas of Montana that are predominately grasses and shrubs, as is the case in the DFO. While conifer expansion provides cover for elk, the reduction in herbaceous and shrub forage for wintering big game outweighs these benefits, especially with abundant adjacent conifer habitat available surrounding treatment units. During the winter, mule deer prefer mountain mahogany, then sagebrush, with juniper being more of a last resort when preferred browse species are not available whether due to loss of browse species or inaccessibility from deep snow (pers. comm. Waltee, 2016).

Coordinating the timing (seasonally and yearly) of prescribed fire treatments between fire managers and wildlife biologists would minimize conflicts with wildlife. Surveying for special status species prior to these treatments would also reduce impacts to these species through avoidance and timing stipulations. Pygmy rabbits are sagebrush obligates and have not been documented within the proposed treatment units. Surveys would be completed prior to treatment and, if pygmy rabbits are found, stipulations to avoid burrow complexes would be applied. Impacts to migratory birds would be negligible since the prescribed fire treatments would be implemented outside of nesting season. As covered in the Monitoring Plan (Appendix B), if prescribed burns are implemented after May 15, migratory bird surveys would be completed prior to burning activities. As covered in the Biological Evaluation (Appendix C), habitat or individuals may be impacted by these treatments, however treatments would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. If left untreated, sagebrush grassland habitat with conifer expansion would transition into forest habitat, eliminating sagebrush obligate species' (such as sage grouse, sagebrush sparrow, Brewer's sparrow, and sage thrasher) habitat. Forage and cover would initially be reduced in the short-term. However, as sagebrush cover returns to the burned areas and the potential for forest habitat

to expand has been reduced, habitat for these species would be restored for the long-term, resulting in a net conservation gain for sage grouse. Although some avian species of tree and cavity nesters may benefit from conifer expansion, grassland and sagebrush obligates decline with increasing conifers (Coppedge et al. 2001, Rosenstock and Van Riper 2001, Reinkensmeyer et al. 2007). In areas where western juniper was removed from sagebrush habitat, Brewer's sparrow, green-tailed towhee, and vesper sparrow densities increased (Holmes et al., 2017). This study shows that multiple species of ground and shrub nesting birds can benefit from conifer removal projects intended to retain shrub cover and note that *"broadcast burning is a cost-effective and appropriate tool for restoring ecological processes and achieving long-term resource objectives but should not be expected to yield immediate benefits for shrub-dependent birds"*.

Sagebrush habitat loss to conifer expansion can be detrimental to sagebrush obligates, especially species of conservation concern, such as the sage grouse (Baruch-Mordo et al. 2013, Knick et al. 2013). Baruch-Mordo et al. (2013) found that sage grouse incur population-level impacts at a very low level of conifer expansion, as no leks were active in areas where conifer canopy cover exceeded 4%. This study also found that sage grouse have a negative response to areas of active conifer expansion in addition to areas with more established stands. This study suggested that female sage grouse eventually abandon habitats when trees become too pervasive across the landscape. These results align with other studies' findings of sage grouse avoidance of conifer habitats during all stages of life (i.e. nesting, brood-rearing, and wintering) (Doherty et al., 2008, Atamian et al., 2010, Casazza et al., 2011). Doherty et al. (2010) found that sage grouse avoided nesting within 100 meters of conifers in Montana. Severson et al. (2016) found that the relative probability of sage grouse nesting was negatively associated with >3% conifer cover within 800 meters of nests. They note that "*sage grouse are expected to lose nesting habitat as conifer expansion continues, but management intervention may be a possible solution to increase habitat availability where open space for nesting is a limiting factor"*. They also found potential increases in nest survival and female survival at a landscape scale, with increased use of nesting and seasonal habitat following conifer removal in their study area (Severson 2016, Severson et al. 2017a). Female sage grouse were 43% more likely to nest within 1000 meters of areas where conifers had been removed, with 29% of the radio-collared population moving to nest in mountain big sagebrush habitats that were cleared of encroaching conifers (Severson et al. 2017a). This study also found the importance of distance to conifer removal treatments, with a larger positive benefit than the actual area where conifers were removed, producing more nesting habitat surrounding the treatments. Increases of 6.6% annual female survival and 18.8% nest survival relative to the control area were documented where conifers were removed (Severson et al. 2017b). Sandford et al. (2017) found that conifer removal treatments can increase suitable available sage grouse nesting and brooding sites, with enhanced nest and brood success. Sagebrush habitat with scattered isolated trees can function as ecological traps for sage grouse and Coates et al. (2017) support reducing conifer cover to as low as 1.5% to increase sage grouse survival. Conifer expansion can increase perch availability for avian predators. Sage grouse encounters with conifers can result in sage grouse making faster and riskier movements, which increases their vulnerability to visually acute predators and reduces survival (Prochazka et al. 2017).

Miller et al. (2000) documented that mountain big sagebrush cover is reduced by 80% when juniper cover increases to half of its maximum potential for the site. Over the past 150 years

conifers have expanded their range by as much as 600% in the western U.S. (Romme et al., 2009). Because fire removes sagebrush cover it seems counter-productive to burn existing sagebrush habitat, however periodic fires in mountain big sagebrush is critical to reduce conifer expansion (Davies et al. 2011). An estimated 90% of conifer expansion has occurred in sagebrush ecosystems (Miller et al. 2011). The higher-elevation mountain big sagebrush habitat, like that within proposed mechanical and prescribed fire treatment units in the RRLW, have relatively high productivity, with more frequent pre-settlement fires due in part to more fire-tolerant species capable of recovering in a shorter period of time, with lower risk of transitioning to undesirable alternative states (Baker 2011, Davies et al. 2012, Chambers et al. 2017). Chambers et al. (2014) concluded that mountain big sagebrush with cool and moist soil temperature/moisture regimes had moderately high resilience to fire and mechanical treatments, with increased perennial native herbaceous and shrub species recruitment and resistance to annual exotics.

Mountain big sagebrush provides cool, moist habitat for conifer seedlings to establish under. Once conifers exceed sagebrush height, they shade out and kill the sagebrush, eventually transitioning the site into conifer-dominated. Disadvantages of using mechanical treatments alone include follow-up treatment for small trees that were not initially removed, fuel loads can be increased by leaving cut trees/slash on the site, and treatment can be difficult to implement and costly when working in areas with rough terrain (Miller et al. 2007, Davies et al. 2011). Prescribed fires are more efficient than mechanical treatments across large landscapes because they control tree seedlings that would otherwise be missed with mechanical treatments and woodland development is less rapid than where fire surrogates are used (Miller et al. 2007; Miller et al. 2013). Boyd et al. (2017) found that cutting conifers benefits sage grouse habitat, but the effects only last a few decades since conifer seedlings are not removed and the seedbank remains, whereas fire treatment lasts longer than mechanical treatments alone. They estimate that "*fire has twice the treatment life of cutting at time horizons approaching 100 years, but has high up-front conservation costs due to temporary loss of sagebrush. Cutting has less up-front conservation costs because sagebrush is unaffected, but it is more expensive over longer management time horizons because of decreased durability. Utilizing a combination of fire and cutting treatments is most financially and ecologically sustainable over long time horizons in managing conifer-prone sage grouse habitat*."

The USFS Beaverhead-Deerlodge National Forest has utilized prescribed fire to treat conifer expansion in southwest Montana and found that burning provides at least 20 years of treatment effectiveness over mechanical treatments alone, and 150 trees/acre seems to be the cost effective breakpoint in deciding to burn versus lop and scatter only (pers. comm. Hutton, 2016). Within these USFS treatment units, conifers are in need of retreatment within unburned patches that had conifers only mechanically removed, whereas adjacent burned areas have not had conifers return. Burning is more effective at conifer control than just mechanical treatments because small (< 1 m) conifers are not easily seen, especially when sheltered under sagebrush, and burning the seed-bank would forestall conifer recruitment; thus, extending the desired results from the proposed treatments and treatments that leave residual woodland cover are unlikely to establish sagebrush birds (Knick et al., 2014). The photos below show the Butcher Gulch allotment, an area bordering Virginia City, Montana where mechanical treatment was the only method used to reduce conifer expansion. Based on the large number of the seedling/sapling conifers in the

2016 photos, using mechanical alone was a totally ineffective treatment, with more conifers expanding onto the site eight years post-treatment compared to pre-treatment.

PHOTO 4.7: BUTCHER GULCH ALLOTMENT, DILLON FIELD OFFICE, PRE-MECHANICAL TREATMENT, 2008.

PHOTO 4.8: THE SAME PHOTO POINT AS ABOVE, EIGHT YEARS POST MECHANICAL TREATMENT, 2016

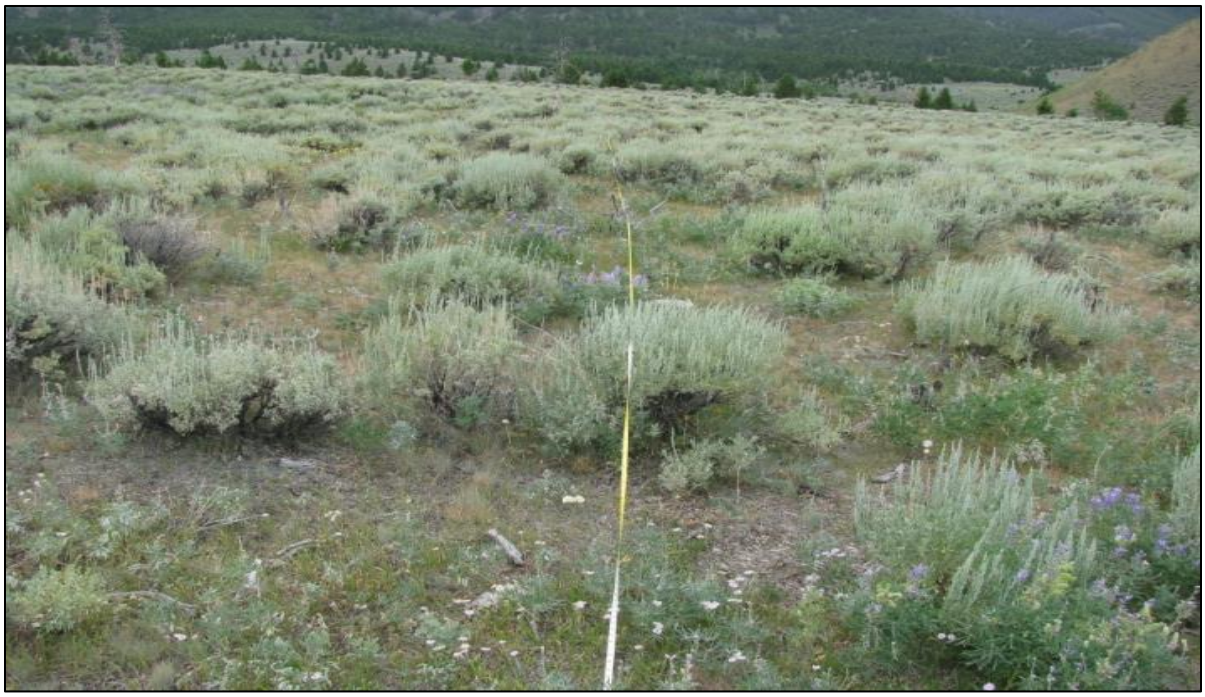
PHOTO 4.9: BUTCHER GULCH ALLOTMENT, DILLON FIELD OFFICE. EIGHT YEARS POST-MECHANICAL TREATMENT. LOOKING TOWARDS ALDER GULCH, JULY 2016.

Maintaining productive sagebrush plant communities for sagebrush obligate wildlife species, while burning acreages necessary to stop conifer expansion is crucial (Davies et al. 2011). Lesica et al (2007) note that while studying 28 prescribed and wildfire sites in southwest Montana, mountain big sagebrush returned to pre-burn canopy cover and height 32 years later on average and in as little as 7 years on some sites. Across ten sagebrush sites where spring prescribed burns were used to reduce conifer encroachment in southwestern Montana (Dillon Field Office) and eastern Idaho, 13-27 years were required for burned areas to be indistinguishable from undisturbed reference areas (Woods, 2012).

Herbaceous cover and species richness, including forbs and arthropod abundance, have been documented to recover quickly following fire in mountain sagebrush habitat (Davies et al., 2014; Pyle & Crawford, 1996; Beck et al., 2011; Bates et al., 2009; VanDyke & Darragh, 2006; Seefeldt et al., 2007; Davies et al., 2012). Burning has potential to enhance mountain big sagebrush nesting and brood-rearing habitat in small patches (Beck et al. 2011). Connelly et al. (2000) suggest using fire to create a mosaic of openings in mountain big sagebrush communities used as late brood-rearing habitats, with 10-20% sagebrush canopy cover and ≤25% total shrub cover providing adequate summer sage grouse habitat. Danvir (2002) found that sage grouse broods readily used burns with broad-leaved forbs and that cool season controlled burns in summering areas were beneficial to sage grouse. While forbs and insects are a major component of sage grouse brood diets and typically increase following fire, the goal of utilizing prescribed fire is for long-term retention of sagebrush habitat, because once sagebrush habitat that has

conifer expansion transitions into forested habitat, the sagebrush habitat is lost.This photo shows a line-intercept transect running through a prescribed burn unit in the Dillon Field Office in July, 2013 that was burned in spring of 2000. At the time of this photo, mountain big sagebrush cover at this transect was 23.3%, with an average height of 52.3 cm. Within the burn unit, average mountain big sagebrush cover was 23.5% and 49 cm tall. Conifers were not returning on any of the transects. This is thirteen years post-burn. Forb and herbaceous cover, especially forbs in the legume family (lupine) that are preferred sage grouse forage, can be noted in the photo.

PHOTO 4.10: MOUNTAIN BIG SAGEBRUSH SITE, PRESCRIBED FIRE, 2000. DILLON FIELD OFFICE. PHOTO TAKEN JULY 2013.



Alternative B

Livestock Grazing

Bell Canyon: If a water trough is added in the South Flats Pasture off of the pipeline spur, it would result in livestock congregating around it. The water trough would be close to a wildlife guzzler. Livestock calves may breach the fence around the guzzler and drink it dry and the increased livestock congregation in the area may limit wildlife use of the guzzler. The placement of the trough may eliminate the usefulness of a guzzler at this location.

Cedar Creek, Williams, and Shoshone Cove Allotments: Changing the season of use from the growing season to dormant season would increase vigor of herbaceous and forb species that provide forage and cover for wildlife. Cedar Creek and Shoshone Cove allotments are within a sage grouse PHMA, with two leks in the area. Livestock would not be present on the allotment during sage grouse nesting/early brood-rearing season and nesting cover would be enhanced without grazing during the growing season. Dormant season use would reduce residual herbaceous cover from the previous growing season. Mule deer and elk winter throughout the Henneberry Ridge area, and antelope winter range also extends across Williams and Shoshone Cove allotments. Livestock would be grazing during the big game wintering period, potentially reducing residual herbaceous forage for wintering elk depending on how much overlap there is

between areas of use throughout the allotment. Adhering to the 50% utilization threshold is intended to leave adequate forage and cover for wildlife. If grazing is authorized from 4/1-4/30, cattle would be present during sage grouse lek season. Disturbance to lekking birds would likely be minimal, considering the small size and location of the leks in comparison to allotment acreage.

Clark Canyon Allotment: Reconstructing the division fence between the Dry Gulch and State/Buck pastures would add 1,200 feet of fence. This adds an entanglement and collision hazard to the landscape for wildlife, especially big game calves and fawns.

Gallagher Mountain AMP: Deferring grazing by two weeks would allow vegetation that much more time to establish during the growing season. Changing from spring grazing every other year to spring grazing every fourth year in the Warm Spring and Dry Mast pastures would improve herbaceous forage and nesting cover. Adding rest to the Clark Canyon pasture is also likely to improve vigor of grasses and forbs. This allotment receives year-round big game use and is mule deer and elk winter range. The installment of electric fences to divide the Gallagher and Lovell pastures would add a collision and entanglement hazard for wildlife moving through the area. This temporary fencing that can be let-down and single strand is more wildlife-friendly, as opposed to three or four strand barbed wire fencing. Constructing an exclosure fence around the small wetland in the Henneberry Pasture would protect this habitat from livestock concentrating in the area, reducing trampling and increasing vegetation vigor which enhances forage and cover for wildlife. All fences create potential barriers and collision or entanglement hazards for wildlife. Constructing to wildlife-friendly specifications is intended to reduce these risks.

Norris Canyon: Fairly heavy elk winter use was noted during the assessment on this allotment. Removing fall use and adding rest would leave more residual herbaceous forage for wintering elk.

North McKnight: Placing the water trough in the North McKnight allotment, as opposed to the Bell Canyon allotment would eliminate livestock from congregating near the wildlife guzzler, reducing the chances for livestock calves to breach the guzzler fence and drink it dry. Increased livestock presence in the area may reduce wildlife use of the guzzler, reducing the usefulness of having a guzzler at this site.

Pinetop Hill: Constructing an exclosure fence along reach 992 would be an additional collision and entanglement hazard for wildlife. Building to wildlife-friendly specifications and would reduce these risks. Protecting reach 992 from livestock use and trampling would enhance vegetation vigor for wildlife cover and forage.

Snowline AMP: Reducing growing season use and hot season days on the Pine Butte Pasture, is anticipated to increase vigor of herbaceous and forb species and reduce the amount of time that livestock spend in riparian areas, improving forage and cover for wildlife. This pasture is within two miles of a sage grouse lek, so every third year grazing would occur in the spring during sage grouse nesting season. The reduction to 14 days in the spring every third year from 47 days in the spring/summer every third year greatly reduces the amount of time livestock are present during nesting/early brood-rearing. Under Alternative B, livestock would be in the North West Dutch Hollow, Field A2 and A3 pastures for 2-3 weeks less than Alternative A. Grazing impacts on nesting habitat are further discussed under Impacts Common to All Alternatives. The

proposed exclosures and fences add collision and entanglement hazards for wildlife. Constructing fences to wildlife-friendly standards reduce these risks. The proposed water developments are intended to improve mesic and riparian conditions, reducing livestock impacts and enhancing vegetation vigor for wildlife forage and cover. The removal of 1.5 miles of net wire fence between Dutch Hollow North Pastrue and Field 4 and Field 4a Pastures would eliminate the collision and entanglement hazard, improving wildlife movement through the area.

Truax: Developing spring 2402 would keep livestock out of the spring area, reducing trampling and grazing of riparian/mesic vegetation, increasing forage and cover for wildlife.

Non-commercial Mechanical/Prescribed Fire:
Of the 1,186 acres proposed for non-commercial mechanical/prescribed fire units in Alternative B, approximately 628 acres are within a sage grouse GHMA. This comprises roughly 1.7% of BLM administered GHMA and 0.53% of total GHMA acreage in the RRLW. Sage grouse breeding habitat is considered within 11 miles of a lek for migratory populations, and 3.1 miles for non-migratory populations (Stiver et al. 2015). The Clark Canyon unit is roughly 6 miles from a Henneberry Ridge lek, across I-15 to the northwest and the Bell Canyon unit is over 10 miles from that lek and 8 miles from a lek in the Medicine Lodge drainage. Sage grouse from these leks are likely non-migratory. Although the proposed treatment units are within nesting/early brood-rearing habitat, areas with conifer encroachment are considered unsuitable habitat if conifer canopy cover is greater than 4% and marginal habitat if the seasonal habitat exhibits some degree of conifer encroachment (Stiver et al., 2015). Since these units are being treated for phase I or phase II conifer expansion, they are considered unsuitable sage grouse habitat and hens are unlikely to use these areas for nesting and brood-rearing.

Due to the conifer expansion creating unsuitable habitat and deterring sage grouse from using the treatment units, disturbance to sage grouse within these units is unlikely. While individuals and habitat may be impacted, treatment would not contribute to a trend towards federal listing or cause a loss of viability to the population or species. Overall, utilizing mechanical/prescribed fire treatments would transition this habitat that is currently unsuitable for sage grouse into more suitable seasonal sage grouse habitat. Without treatment, these areas would continue to transition into forested habitat and not be suitable for sage grouse again in the foreseeable future. These treatments have been planned with full interdisciplinary input and coordination with the local MFWP wildlife biologist. See above under Impacts Common to All Action Alternatives for additional discussion about sage grouse, conifer expansion, and non-commercial mechanical/prescribed fire treatment.

The proposed treatment units are within mule deer and elk winter range. Prescribed burns may occur as early as March, which may disrupt big game on winter range. Implementation of treatment units would be coordinated with biologists as defined in the design features. Burns would be patchy and would not cover the entire area, although wildlife would be pushed out of the area during implementation. Treatment implementation covers a short time period, reducing disturbance. With treatments staggered across locations and years, and extensive winter range surrounding the units, big game would have adequate winter range if pushed out of an area during implementation. Coordination with MFWP wildlife biologists did not result in concerns for stipulations to be included.

The Maurer Mountain fire burned in the late summer of 2017. The East Fork2 unit in the Clark Canyon allotment borders this fire perimeter. Prescribed burning should not occur in this unit for several years to allow vegetation to re-establish in the adjacent burned area. This is not a concern since prescribed burning would not occur within a shorter timeframe.

Commercial Harvest:
Migratory bird nests in forested habitat are difficult to detect and therefore nesting migratory birds may be impacted if harvest occurs between May 15th and August 1st. Individuals or habitat may be impacted, but treatments would not likely contribute to a loss of viability to populations or species. Overall, the salvage of dead/dying timber, decrease in future insect and disease hazard, increase in stand vigor and diversity of age and size classes within historical fire regimes, and maintenance/enhancement of aspen would benefit migratory bird nesting and foraging habitat. The increase in herbaceous and shrub species, with the opening of the forest canopy, would provide cover and foraging habitat for big game, small mammals, large carnivores, raptors and other birds. Salvage harvesting these units would create regeneration of healthy trees used by foliage and bark gleaning bird species. The removal of dead/dying timber would reduce availability of cavity nesting habitat and wood-boring beetle larvae that woodpeckers and flickers utilize. However, dead/dying timber is not a limiting factor across the landscape for these species, and at a minimum, an average of two to five snags or green recruitment snags would be left per acre within treatment units. Retaining large-diameter snags and trees during commercial harvest could have minimal or positive effects on bat populations utilizing the forest stand as roosting and foraging habitat (Boyles and Aubrey, 2006; Patriquin and Barclay, 2003; Schmidt, 2003).

Harvesting trees would remove big game thermal and hiding cover. Patches of uncut timber would also be left within treatment units to provide hiding cover and break up sighting distances. Depending on the species, small mammals that prefer early and mid-seral grasses, forbs, and fruit-producing shrubs benefit from opening canopy cover, while retention of untreated patches of trees with adequate understory vegetation may benefit hare populations (Pilliod et al., 2006). Availability of moist duff and litter and rotting down wood influences upland habitat use by forest amphibians. Effects of prescribed fires within forest habitat on amphibians is influenced by the location of fires in proximity to breeding habitats, season of fire, and amphibian species. Western toads forage on ants and ground beetles, finding shelter under logs, rocks, and in rodent burrows within burned habitats (Pilliod et al., 2006). Many species may be minimally affected by fuel treatments, while others may experience short-term negative effects (McLeod and Gates, 1998; Schurbon and Fauth, 2003). Potential stream sedimentation associated with commercial harvest and prescribed fire activities can be a concern for egg and tadpole survivorship. Adherence to State and Federal permits for stream crossings are intended to mitigate these potential effects.

All temporary skid trails and temporary routes would be re-contoured/reclaimed post-harvest and not open to the public. The open road density would remain the same as prior to harvest. Constructing up to 7.25 miles of temporary road is a concern for wildlife security, with increased motorized access to areas previously inaccessible. Roads constructed for timber harvest would all be temporary and reclaimed upon completion of harvest, not adding to mileage of open roads in the DFO. Although the area is not currently accessible to the public across private property, constructing new roads would enhance ease of travel in the area, and if not effectively closed,

increase unauthorized motorized vehicle use in the area. Effective road closure and/or obliteration is important for wildlife security.

Harvesting trees would remove big game thermal and hiding cover. However, regeneration of new stands would occur faster than if the dead and dying trees are left standing for many years and eventually becoming deadfall. It would take many more years before enough sunlight could reach the soil surface to promote regeneration. Although elk are not excluded from areas with substantial amounts of dead and down materials, they tend to avoid these situations (Thomas and Toweill, 1982). Harvesting the trees opens the canopy and facilitates regeneration sooner, providing hiding and thermal cover, and increasing forage quantity and quality. Scattered patches of uncut timber within treatment units would provide some hiding cover. Retaining patches of dense cover provides security and escape cover adjacent to treated areas.

The proposed commercial harvest units are within mule deer and elk winter range. Elk winter range extends from Lovells Gulch area of Gallagher Mountain AMP, south to the Kidd area in Sage Creek watershed. Mule deer winter range also extends from Lovells Gulch to just north of Lima. Through coordination with the MFWP wildlife biologist, it was recommended that commercial harvest activities do not take place during the wintering period between December 1st and May 15th. The commercial harvest units are also within elk calving habitat, however the majority of calving occurs to the east/southeast into the Sage Creek watershed. A small percentage of individuals may be disturbed if harvest activities occur during elk calving and mule deer fawning, however impacts would be negligible at the population level and offset in the long-term with improved calving and fawn rearing habitat (pers. comm. Waltee, 2018). Elk prefer to calve in sagebrush habitat in close proximity to forest escape cover with shrubs, down logs, and broken terrain for calf concealment (Thomas and Toweill, 1982).

Mountain Mahogany Treatments:

PHOTO 4.11: HEAVILY BROWSED MOUNTAIN MAHOGANY

Success of planting mountain mahogany where the stands are largely dead/decadent is unknown since protecting the planted mahogany from ungulate browse is key in these heavily browsed stands. To increase chances of success, encroaching juniper and Douglas-fir would be cut within the mahogany stands and left laying around planted and young age-class mahogany as browse barriers. Cutting encroaching juniper and Douglas-fir may impact individuals and habitat of nesting birds, however it would be completed at a minimal scale, without causing a loss of viability to populations or species.

Riparian Vegetation Treatments:
Juniper expansion into riparian areas was noted as a concern in the RRLW for big game and migratory birds. Removing juniper from riparian areas would allow more light, water, and nutrients for riparian deciduous vegetation to return. Deciduous riparian vegetation including willows, dogwood, alder, birch, and aspen provide forage for moose and other big game, as well as forage and nesting habitat for migratory birds, especially riparian associated and obligate species. Results from the University of Montana Bird Ecology Lab (UMBEL) monitoring of vegetative and bird responses to the DFO's removal of junipers along riparian areas in the South Tobacco Roots watershed confirmed that cutting was effective in substantially reducing or eliminating juniper trees from affected stream sections. Significant increases in riparian shrub and tree seedling cover was measured. Avian shrub and tree nesting guilds showed a positive response five years after treatment. This study anticipates that restored streams will continue to have an increase in riparian forest density as young seedlings recruit to larger size classes, which will influence riparian associated bird communities (Noson, 2016).

The reduction in decadent willow stands and associated boost of willow regeneration and recruitment, utilizing prescribed fire, would also enhance forage, cover, and nesting habitat for big game and migratory birds in the wetland/riparian habitat of Reach #2401. Following prescribed burning, willow cover would be absent, limiting nesting and hiding cover, and browse until regeneration occurs. Willows are anticipated to regenerate within one to two years. Although willow cover would be removed in the short-term, over the long-term there would be more vigorous willow cover for wildlife. Burning would occur outside of waterfowl and migratory bird nesting season between April 15-August 1.

Travel Management:
Throughout the RRLW, there are approximately 851 miles of roads, 130 miles of these are designated open routes. There are approximately 198 miles of roads on BLM administered lands within the RRLW, 90 miles of these are designated open roads. There are at least 22 miles of unauthorized routes on BLM administered lands in the watershed that are in addition to mapped designated and undesignated roads. These routes have been created by public land users on a yearly basis and continue to be used thereafter. Creation of these unauthorized routes and travel on undesignated routes reduces elk distribution on public lands, decreases hunter opportunity under fair chase conditions, and makes population management efforts less effective (pers. comm. Waltee, 2016). It also compromises public safety, promotes publically unacceptable herd shooting of elk, facilitates unmanageable noxious weed infestations, and increases soil erosion and stream sedimentation. Noxious weed spread and soil erosion threaten abundance and diversity of native plants, which wildlife and livestock depend on for forage. Off-highway vehicle (OHV) use continues to grow in popularity and contributes to creation of unauthorized routes and use of undesignated roads. OHV use reached 36 million participants in the early 2000s (Cordell, 2012) and is projected to increase between 30-60%, to 62-75 million participants, by 2060 (Bowker et al., 2012). Elk avoid trail-based recreation, with avoidance highest during OHV riding (Wisdom et al., 2018). This displacement increases energetic costs while reducing foraging time, and is a form of habitat loss in areas that would otherwise be selected by a species if humans were absent. This can lead to large-scale population shifts by elk from public lands to private lands, eliminating hunting and viewing opportunities on public lands (Proffitt et al., 2013).

Elk security is important for elk population management, hunter opportunity, and elk displacement from preferred habitats. Hunter-harvest increases with increased road density, however hunter success rates are lower in highly roaded areas (15%) compared to areas with managed road networks or roadless areas (25%) (Gratson and Whitman, 2000). Although more elk are killed near roads, more elk are displaced by road traffic to areas with lower road densities. In Montana, a study documented that area closures that restricted motor vehicles to a few selected roads during the general hunting season led to hunter feedback reporting seeing and harvesting more elk and a preference for limited access because it afforded a higher quality hunt (Lyon et al., 1985). Elk use of habitat was reduced by up to 95% within ½ mile of a road (Perry and Overly, 1977). A study completed in southwest Montana during the fall hunting season found that, "female elk selection for areas restricting public hunting access was stronger than selection for security habitat, and the density of roads open to motorized use was the strongest predictor of elk distribution" (Proffitt et al., 2013). Another study completed in southwest Montana during archery and rifle hunting seasons recommends managing for areas with ≥13% canopy cover that are ≥1.71 miles from motorized routes, identifying areas of high nutritional resources. During the rifle season, they recommend managing for areas with ≥9% canopy cover that are ≥0.95 miles from motorized routes and at least 5,000 acres (Ranglack et al. 2017). The RRLW is largely sagebrush grassland habitat, rather than forested, and lacks the 9-13% canopy cover suggested in this study, making habitat availability further from roads more important in these areas. Impacts to wildlife from the proposed travel management changes under Alternative B would be similar to Alternative A, under alternative B an additional 0.2 miles of route would be designated open. Working with mobile media mapping companies to label open roads would help motorized vehicle users identify and more easily adhere to travel management designations. Obliterating and reclaiming user-created routes would discourage further use and reduce motorized access into those areas, increasing wildlife security. Better compliance from public land users to not utilize routes that are not designated open would enhance wildlife security, including big game, and also enhance hunting experience and opportunity.

Alternative C

Livestock Grazing

Snowline AMP: Constructing 1.5-2 miles of new fence to divide the Pine Butte Pasture would increase the amount of fencing on the landscape, impacting wildlife movement through the area. The new fence would be an additional entanglement and collision hazard. Building to wildlife-friendly specifications and marking the fence reduces these risks, but does not eliminate them. More concentrated use would occur with all of the livestock grazing half of the Pine Butte Pasture at a time. This would occur during sage grouse nesting/early brood and late brood-rearing season once every third year. Reducing the duration of grazing in each newly created pasture from 47 days to 24 days increases vegetative recovery time, intended to improve vigor for wildlife forage and cover.

Non-commercial Mechanical/Prescribed Fire Treatments: For the non-commercial mechanical/prescribed fire units, impacts would be the same as listed above under Alternative B and Impacts Common to All Action Alternatives, with an additional 727 acres. Of the 1,913 acres proposed for non-commercial mechanical/prescribed fire units in Alternative C, approximately 1,355 acres are within a sage grouse GHMA. This comprises roughly 3.7% of BLM administered GHMA and 1.2% of total GHMA acreage in the RRLW.

Alternative D

Livestock Grazing

Snowline AMP: Removing livestock grazing from the Pine Butte Pasture would eliminate the need to construct new fences, water developments, and pipelines as proposed under Alternatives B and C. Not adding more fencing to the landscape benefits wildlife moving through the area, without additional entanglement and collision hazards. Vegetative vigor would improve, especially in mesic and riparian areas without livestock grazing impacts, increasing wildlife forage and cover.

Cumulative Effects

A reasonably foreseeable action, if Alternative D were implemented and livestock grazing were removed from the Pine Butte Pasture of the Snowline AMP, would be the permittee fencing out their private and DNRC lands to continue grazing. This would add roughly 3.3 miles of fence to the landscape, increasing entanglement and collision hazards, particularly for birds and big game. It is not a BLM action, nor is it a guarantee. However, if over 3 miles of fence were constructed, it would be an increase of 1-1.5 miles of fence over that proposed under Alternative C for Snowline AMP.

The State of Montana, USFS, BLM and NRCS have completed sage grouse conservation plans and Resource Management Plan amendments. The BLM intends to continue to work cooperatively and collaboratively with other agencies and landowners for sage grouse conservation. The DNRC is working on planning to implement Field Office-wide removal of conifer expansion on DNRC lands. Similar efforts by the USFS are also planned. These efforts, along with BLM's conifer expansion projects, are anticipated to reduce conifer expansion, retaining sagebrush habitat for the long term on a larger landscape scale. This benefits not only sage grouse, but other sagebrush obligate species including pygmy rabbits, Brewer's sparrow, sagebrush sparrow, and sage thrashers.

Mesic restoration projects are also being done collaboratively across land ownerships with multiple groups, landowners, and agencies. Improvements to riparian and mesic habitats would improve sage grouse brood-rearing habitat, as well as forage and cover for big game, birds, and amphibians.

Mountain mahogany is heavily browsed across the Field Office. Conifer expansion is also outcompeting and shading mountain mahogany. Reduced vigor and decadence are anticipated to continue, removing this important browse and cover from certain areas in the watershed.

Areas of the watershed with high sagebrush canopy cover will continue to be outside the sage grouse habitat objectives for sagebrush cover until natural mortality occurs, perhaps thinning the stand. If sagebrush canopy cover continues to increase, herbaceous and forb cover may decrease, reducing those habitat components for wildlife forage and cover. Sagebrush cover would be reduced on private lands where sagebrush is chemically treated or burned.

Fences across all landownerships in the watershed pose collision and entanglement hazards, as well as barriers where wires are too high/too low or where net wire is used, especially for antelope and big game fawns and calves. BLM removes and modifies fences every year, which will reduce these impacts. While BLM builds new fences every year as well, they are constructed to wildlife-friendly specifications. Fences built on other landownerships may not be

built to wildlife-friendly standards, increasing the risks of collision and entanglement or barrier fences.

Off-highway vehicle use is anticipated to increase across the watershed. Along with OHV use, travel on closed/undesignated routes and creation of new roads is also likely to increase. Use of undesignated routes reduces big game security, increases weed spread, increases soil erosion and stream sedimentation, reduces elk distribution on public lands, reduces hunter opportunity under fair chase conditions, and makes population management efforts less effective. Addressing travel management issues across ownerships would help alleviate these impacts.

Resource Concern #2: Socioeconomics Environmental Effects

Effects common to All Alternatives:

BLM managed public lands within the RRLW contribute to the local economy primarily through two economic sectors. These sectors are agriculture, in the form of livestock grazing directly to the authorization holder, their business and employee's, and the local industries that support the agricultural sector. BLM does not have access to the financial or business records for the grazing authorization holders. Therefore it is impossible to provide a detailed or quantifiable discussion of individual ranch operations or economic conditions. As the fee for BLM AUM's are considerably cheaper than state and private lease rates, federal grazing authorizations are typically of economic benefit to the authorization holder, even if there are other indirect costs such as increased labor costs associated with them. In 2018, the standard fee for a BLM AUM is $1.41, with a surcharge for running someone else's livestock of $8.08. The rate charged by the Montana DNRC is $11.03. Private land rates vary. According to BLM IM 2018-043, the average lease rate for a private land AUM in the state of Montana in 2018 is $24.50. The second economic sector is recreation and recreational opportunities, including but not limited to camping, hunting, fishing, hiking, aesthetic appeal, and off highway driving. Many local businesses benefit indirectly from these recreational opportunities; however some businesses are directly tied to the recreational opportunities within the RRLW in the form of Special Recreation Permits. Economic impacts to businesses and commercial outfitting operations in the area are not expected to be measurably affected from any of the Alternatives. Refer to Chapter 4 on page 302 and table 56 on page 286 in the 2006 Dillon RMP as amended for further information.

To a lesser degree, the timber industry could be impacted by management actions proposed within the RRLW.

In general, actions that benefit livestock grazing or recreational opportunities would have a positive impact on local economy and socioeconomics, while actions that restrict, reduce, or remove/eliminate recreational or livestock grazing opportunities would have a negative impact on local economy and socioeconomics.

Actions that are proposed to improve habitat, without incurring a cost to the public would generally have a beneficial indirect impact to the recreation industry, and potentially to the livestock industry. Impacts from these actions will not be analyzed further.

Under all alternatives, livestock grazing permits would be issued with "other terms and conditions" addressing the use of riding, herding, salting, and electric fence to improve livestock

use and distribution. Additionally utilization and stubble height thresholds would be placed on the permits. Requirements such as these often require additional labor input costs by the authorization holder to monitor and follow these stipulations. However close monitoring of the resource conditions, and subtle changes to livestock management allow for better livestock distribution and attainment of upland and riparian thresholds. Implementation of utilization and stubble height restrictions may have an annual cost to the authorization holder, as they may require livestock to move through and off an allotment quicker or before all of the available AUM's are harvested. These stipulations are in place to ensure that livestock grazing is a long term sustainable practice on the allotment(s) reducing the potential need to reduce available forage over a longer term basis. The degree to which additional labor costs may be incurred, or the potential loss of forage due to thresholds depends on a variety of factors such as the resources within an allotment, the type of livestock grazed, duration of grazing, season of use, etc.

Under all alternatives previously approved Non-Commercial Mechanical/Prescribed Fire Treatments would be carried forward and could continue to be implemented. These treatments could occur through a variety of methods, but are intended to reduce the amount of conifer encroachment into sagebrush and grasslands. Over the long term this would have a slight benefit to grazing authorization holders, by maintaining or increasing the amount of herbaceous production on the allotment, however there may costs to the authorization holder to implement the treatments. If prescribed fire is utilized, the treatment area may need to be rested from grazing prior to treatment to allow fine fuels to carry fire. Additionally treatment areas would need to be rested for at least two growing seasons following the prescribed fire for plant recovery. Rest may be incorporated on an allotment, or pasture basis, potentially resulting in a loss of forage during the closure. Treatments would be scheduled to have the least impact to the livestock operation as practical (IE. Conducting treatments during regularly scheduled rest years). To offset these costs, temporary electric fence may be used to keep livestock off of the treatment area, however this too would have economic costs associated with installing, maintaining and routinely checking the fence.

Noxious and invasive species management would continue in cooperation with Beaverhead County. Continued and improved weed management would benefit all sectors of the economy that utilize public lands.

Specials Status Species restrictions and or stipulations would in general have a direct and/or indirect economic impact to project proponents, typically incurring more costs to project proponents. Limiting construction activities within the boundaries of special status plant habitat could increase the costs of constructing projects in these areas, by either increasing installation costs, long-term maintenance costs for the project or increased total costs to avoid these sites. These costs may not be incurred only by the agricultural industry, but could include Right of Way applicants such as utility companies, etc. Additionally design features such as those to reduce impacts from WNV would increase the installation and annual labor costs associated with stock water troughs as additional design features and maintenance issues would be required. Requiring livestock producers to report grizzly bear conflicts/depredations may have slight increases in labor costs initially, however this requirement is meant to reduce conflicts over time, which would have an economic benefit to livestock producers by reducing stress on livestock and reducing the number of depredations. These stipulations may have an indirect beneficial impact to the recreation industry as they would promote wildlife and wildlife habitat, which is a major economic driver for southwest Montana.

Wilderness Study Area designations would indirectly add operational costs to livestock producers, ROW applicants, utility companies, etc. through increased restrictions, and limitations. WSAs also limit the number of forested acres which can be commercially harvested, resulting in a direct loss of a potential resource for the timber industry. WSAs may have mixed results from the recreational community. Some people are drawn to them for their primitive nature and solitude, while others may be limited by access.

Recreational opportunities and SRP's would continue to occur within the watershed, having an overall beneficial impact to the recreation industry of Southwest Montana.

Cultural restrictions and stipulations may result in increased operating costs for project proponents. Costs would be incurred if project designs are modified to avoid sites, or if unknown sites or resources are encountered during construction. These costs are not quantifiable.

Alternative A – No Action

Under the No Action alternative livestock grazing permits would be issued for a new ten year term with no changes. There would be no new impacts to the livestock producers. Authorization holders could count on new term authorizations at their current levels.

No commercial timber harvests are proposed under Alternative A. Therefore, there would be no economic benefit to the timber industry. As forest health continues to decline the potential for quality wood products in the future could decline.

Without actively reducing conifer expansion into the sagebrush steppe habitat and riparian habitat, overall watershed condition would continue to degrade (as described above) and the amount of available water to downstream water users may be negatively affected. Without action, no short term job opportunities related to restoring riparian, aquatic, and wetland resources would be created.

Existing economic trends and BLM expenditures would continue under Alternative A. Economic and social conditions were analyzed in further detail for the Field Office under Alternative A in Chapter 4 (pg. 314) of the 2006 Dillon RMP.

Effects Common to All Action Alternatives

The economy of Beaverhead County is highly dependent on agriculture. Jobs and tax revenue generated by livestock associated activities are important economic components of southwest Montana. The alternative or combination of alternatives selected by the BLM Authorized Officer may have a financial impact on an individual authorization holder and cumulatively on the economic and social fabric of the larger community.

Under the Action Alternatives, range improvement projects such as water developments and fences are proposed. Each development would have some type of financial requirement from the authorization holder. These requirements may be in the form of contributing labor, materials, or capitol for the range improvement project. All projects are intended to improve livestock distribution, reduce impacts to riparian habitat, maintain utilization/stubble heights, or reduce labor costs by the authorization holder. Therefore, while there would be an initial cost to the authorization holder from the project, there would be long term economic benefits from the project by reducing labor costs, maintaining or improving forage use levels annually and over the

life of the term permit, and/or by increasing livestock performance. In addition implementation of these range improvement projects and many other habitat related projects would affect the socioeconomics of southwest Montana by providing work opportunities for contractors and other employees for initial construction/installation and annual maintenance, as well as supplying materials from local businesses.

Fire Management has the potential to economically impact livestock producers. If fires are allowed to burn for resource benefit an immediate loss of forage may be incurred by the livestock producer. Additionally these areas would be closed for grazing for at least the following two growing seasons. The decision to manage a fire for resource benefit would take into consideration loss of livestock forage, therefore these potential impacts may be mitigated.

Forest and woodland treatments would have a beneficial impact to the forest industry, and potentially the livestock industry. Forest treatments would make timber resources available for harvest. Typically BLM treatments are adjacent to private lands that could potentially be harvested as well, therefore private landowners may benefit. Additionally all treatment units within the RRLW would require access through private property. Short term job opportunities harvesting the wood, transporting the logs, and within the mills would occur. As forest canopies open up, additional forage may become available for livestock grazing. No increases in authorized forage are proposed, however increased animal performance could result from increased forage production.

Riparian, wetland and aquatic restoration practices could have an indirect impact to livestock producers. All of the projects are intended to restore riparian function, spread water, and hold water on the landscape longer. As water is captured and maintained on the landscape longer, or riparian function increases, forage production along these corridoes is expected to improve, because soil moisture would be maintained longer into the season forage quality would also improve. Livestock producers would have an indirect economic benefit from an increased amount of forage and increased quality of forage. Additionally, if the work was contracted, short term job opportunities would be created.

Noxious and invasive species management would include the use of additional bio-control agents. These additional tools may make weed control more effective and reduce long-term treatment/control costs.

Alternative B

Under Alternative B, the livestock authorizations for twenty allotments would not change. The authorization holders for these allotments would continue to receive the economic benefits of the federal grazing authorizations. On the Williams, Cedar Creek, and Shoshone Cove allotments the proposed action would be to change the season of use from a growing season rest rotation to a dormant season rest rotation. These changes are being pursed to reduce labor costs of hauling water, as well as to reduce the potential for livestock being poisoned from several forbs which occur during the spring season. This would be a beneficial effect to the authorization holder. The livestock authorization on the Snowline AMP allotment would be renewed with no initial reduction of forage, however the management system within the Pine Butte pasture would be modified. In addition, several range improvement projects are proposed with costs incurred as discussed in the Actions Common to All Action Alternatives. The AUM's would not change initially, however if monitoring does not show improvement to riparian systems the authorization

would be reduced by 112 AUM's. Based on the BLM Information Memorandum (BLM-IM-2018-043) the average private land AUM in the state of Montana for 2018 costs $24.50. Therefore assuming the operator could find private pasture to lease, close enough to their operation to be economically feasible it would cost them approximately $2,744 per year to replace the lost forage assuming that private lease rates remain the same. To achieve improvement to resource conditions and ensure that AUM's are not suspended, additional labor costs associated with riding and herding may be required. The livestock grazing management changes proposed for the Norris Canyon, Gallagher, Gallagher Mountain, and Clark Canyon allotments would not change enough to affect the socioeconomics of the livestock operation.

The proposed range improvements would have impacts similar to impacts discussed under the Features Common to All Action Alternatives sections. As most range improvement projects have been proposed by the grazing authorization holders, these projects will not be discussed, because it is assumed that the operators understand the financial obligations required for these projects. Under Alternative B, two miles of fence, 1.4-2.5 miles of pipeline, and six new stock water troughs are proposed to resolve livestock grazing issues that are impacting resource conditions. Most of these projects are associated with the Snowline AMP allotment. Under alternative C and additional 1.5-2 miles of fence would be required within the Snowline AMP allotment.

The proposed Non-Commercial Mechanical/Prescribed Fire treatment units are proposed in the Clark Canyon and Roe West allotments. Treatment areas within the Clark Canyon allotment would bisect several pastures, if prescribed fire was fully implemented across the treatment units at the same time, there could be a large economic impact from having to rest multiple pastures for multiple years. This could be minimized through temporary fencing, however there would be additional costs associated with this as well. The treatment units could also be divided to ensure only one pasture was treated at a time to mitigate the authorization holder incurring all of the economic costs at the same time.

Commercial timber harvests provide economic benefits, including helping to pay for management for diverse values. America's wood products and paper manufacturing sector employs approximately 900,000 workers, representing nearly 7% of manufacturing jobs in the United States (U.S. Census Bureau, 2011). Jobs in logging, trucking, road construction and forest and management services also benefit indirectly from commercial harvest. Employment related to forest products remains in urban areas of America, but it is especially important in rural communities where there are few other high-wage jobs (Society of American Foresters, 2012). It was estimated in 2002 that the direct forest industry employment in Washington and Oregon produced 13.2 workers per million board feet (MMBF) of annual timber harvest (Lippke & Mason, 2005). A similar study by Keegan et al. (2004) found that harvesting and processing saw timber generates 9 direct full-time jobs per MMBF annually in Montana. Both studies indicated that some mill activity may depend on imported materials from other states and may not be directly linked to local harvests. Seven commercial forest treatment units are proposed within the Clark Canyon allotment. If implemented, these treatment units would likely result in economic benefits to the local timber industry.

Under Alternative B, several travel management changes are proposed that would result in adding 0.2 miles of open routes within the RRLW. Across the watershed this is not likely to

impact the livestock operators, or recreational industries to the point of incurring additional cost or loss of income.

Alternative C

Livestock Grazing:

The only authorization subject to change under alternative C would be on the Snowline AMP allotment. Impacts would be similar to the impacts discussed under Alternative B, however additional costs would be incurred by the authorization holder as ~1.5-2 miles of new fence would be required to implement the Alternative.

Non-Commercial Mechanical/Prescribed Fire:

Impacts within the Clark Canyon allotment would be the same as Alternative B. Under Alternative C an additional treatment unit would be treated within the Bell Canyon and Roe West allotments. Both of these allotments have other treatments proposed, either under Alternative B or from previous decisions. Multiple treatment units over several years, or within several pastures, would have a higher economic impact to the authorization holders because more of the allotments may require rest concurrently and/or for longer periods. The authorization holder for the Bell Canyon allotment is the same entity as is authorized to graze the Clark Canyon allotment, therefore if treatments proposed for both allotments occur at the same time there could be many pastures within the operation that would be required to be closed or fenced. This could result in measurable economic impacts to the business.

Alternative D

Under Alternative D, the AUMs on the livestock grazing authorization on the Snowline AMP allotment would be reduced. Livestock grazing in the Pine Butte pasture would not be authorized. This would be a negative economic impact to the authorization holder, as 388 AUM's would be placed in suspension and not available for use. Using the $24.50/AUM figure discussed under Alternative B, replacing this lost forage would cost $9,506/year. This represents only the BLM forage. Based on the current permitting of 1,065 total AUM's of use within this pasture the operation could have to spend approximately $26,092 annually to replace all of the forage within the Pine Butte pasture. To offset some of the costs associated with not grazing public lands within the Pine Butte pasture, additional fencing within the Pine Butte pasture could be constructed to keep livestock off of BLM managed public land, and onto private and state lands within the pasture. An estimated 3.35 miles of fence would be required along the BLM boundary. Assuming a low cost of $8,000/mile of fence the initial cost would be $26,800, with annual maintenance costs in subsequent years.

Eliminating livestock grazing from public lands has mixed social effects. For the segment of the public land users, who make their living from agriculture and understand the benefits and effects of properly managed herbivory on the land, removing livestock grazing from public lands generally has a negative social impact. For the segment of the public land users who do not make their living in agriculture and like to use their public land for other uses, removing livestock grazing from public land generally has a positive social impact.

Cumulative Effects

The BLM is not aware of any current or future proposals that could become cumulative in nature affecting the socioeconomics in the area from actions taken by the State DNRC or the USFS.

The only actions that could become cumulatively significant to the economic well being of the local grazing authorization holders would be from non-commercial mechanical/prescribed fire treatments. Specifically, prescribed fire treatments proposed as well as those carried forward from previous decisions. These treatments are proposed within the Bell Canyon, Roe West and Clark Canyon allotments. There are two business entities that are authorized to graze livestock on these allotments. Close coordination as to the timing of the treatments, grazing rotation, flexibility, and post treatment management could reduce losses of forage, therefore economic impact. Both business entities do have other authorizations, which could be considered for reducing potential temporary losses of forage from prescribe fire treatments.

Resource Concern #3: Noxious and Invasive Species Environmental Effects

Effects common to All Alternatives:

Human activities, such as road maintenance activities, recreation, gravel mining, and other disturbances, as well as livestock, wildlife and birds, wind, water and wild fire have the potential to spread weeds into and within the watershed. Noxious weeds would continue to be treated as resources allow through the existing cooperative effort between the BLM, Beaverhead County, private landowners and other partners.

Where public lands were meeting land health standards, diversity and vigor of existing vegetative communities helps to minimize the spread and establishment of weed infestations

Effective travel management implementation would prevent further weed spread along closed routes.

Alternative A – No Action

Spread of noxious and invasive species outside of known infestations would be prevented or mitigated. Due to resource constraints, density and/or size of current infestations may not be reduced. Noxious and invasive species would continue to effect vegetative composition and cover, causing increased run-off and soil erosion, reducing forage for livestock and wildlife and affecting biodiversity and upland and riparian health in portions of the watershed.

Effects Common to Action Alternatives

While the proposed forest health and noncommercial mechanical/prescribed fire treatments may allow opportunities for increases in non-native species by reducing canopy cover and increasing soil exposure, research indicates that the increase in non-native species is much greater with a high severity wildfire. Therefore, fuel treatments that effectively reduce wildfire severity may also reduce the risk of post-fire invasion by non-native plants (Hunter et. al, 2006).

While it has been generalized that fire leads to cheatgrass dominance, prescribed fire alone or integrated with other control methods may play a role in reducing cheatgrass abundance. Prescribed fire would also reduce litter abundance, which may lead to increased desiccation of cheatgrass seedlings and a lower survival rate. A reduction in litter may also increase the amount of herbicide reaching the soil surface or the leaves of young seedlings where it must be for a herbicide application to be successful. (Cheatgrass Management Handbook, August 2013) Two other research studies: *Integrated Treatment with a Prescribed Burn and Post-emergent*

Herbicide Demonstrates Initial Success in Managing Cheatgrass in a Northern Colorado Natural Area (Calo, 2012), and *Control of Invasive Weeds with Prescribed Burning* (DiTomaso et al., 2006) show that prescribed fire followed by integrated weed management with herbicides actually increases the control of cheatgrass over just herbicide application alone.

Design features for noncommercial mechanical/prescribed fire treatments, forest and woodland health treatments, riparian, wetland and aquatic habitat enhancement or restoration, and construction of structural projects is expected to mitigate cheatgrass and noxious weed spread resulting from soil disturbance during treatment/project implementation.

Survey and removal of noxious weeds in project areas prior to project startup would help to reduce the spread of any species found in the area. In addition, intensively treating an area for noxious and invasive species immediately following and throughout the summer after a prescribed fire before any of them have a chance to set seed is expected to reduce existing infestations of noxious weeds by reducing the viable seed in the soil.

Biological controls for spotted knapweed, including seed head weevils, root boring weevils and root boring moths that feed exclusively on the target species are expected to reduce the seed production, vigor and competitiveness of existing population of these species. There would be fewer seeds to expand the infestation and reduced vigor would allow native vegetation to compete better with these aggressive invaders and mitigate further spread within and adjacent to existing infestations.

Power washing equipment prior to entering a project area would help to reduce the introduction of new invasive species to an area. The use of hot water (140°F or hotter) on equipment that would enter any water would reduce the chance of spread of aquatic invasive species.

Changes to grazing management that reduce or limit spring grazing or incorporate a year of rest would allow increased plant vigor that would help to increase competition against weed invasion.

Overall there would be an additional 0.2 miles of designated routes miles through travel management. Travel management changes may have an impact on the increased spread of noxious weeds. Routing these routes through areas that are less prone to disturbance would help to mitigate this increase.

Cumulative Effects

BLM is not aware of any current or future treatments that may have a cumulative impact on Noxious and Invasive species within the watershed.

Resource Concern #4: Travel Management Environmental Effects

Effects common to All Alternatives:

Although there would be some changes to certain designated motorized travel routes under the Alternative B, there would continue to be motorized access to most of the BLM managed public lands within this watershed and at levels similar to the past decade. The 2006 Dillon RMP, as amended, already provided for a graduated method for implementing the travel management restrictions identified in order to achieve better compliance. Those additional measures would be implemented even under the No Action Alternative. The recent concerns and complaints that

have been expressed regarding the extent of off-road vehicle violations would be addressed through some of the methods prescribed in the action alternatives regardless of this watershed assessment because they are prescribed in the 2006 Dillon RMP, as amended, and some level of improved compliance would likely occur. For additional analysis of travel managements impacts to wildlife please refer to the section above on Resource Concern 1: Special Status Species and Big Game Habitat.

Alternative A – No Action

The extensive off-road vehicle violations that occur in this watershed would be expected to continue under the No Action Alternative. The BLM identified at least 22 miles of unauthorized user created routes in the watershed. This unauthorized off road use is resulting in loss of big game security, riparian degradation, erosion, and spread of noxious weeds. Travel management regulations would continue to be difficult to enforce due to the minimal law enforcement presence available. Travel management signing would continue to occur to encourage compliance and help to educate the public land users on which routes are open and or closed. With no reductions to route density, travel management would continue to impact wildlife security and displace wildlife. This also negatively impacts hunting opportunities' and experiences.

Alternative B

Proposed changes to the designated routes within the watershed would result in an additional 0.2 miles of designated routes open to motorized vehicle travel (out of a total of approximately 90 miles of designated open routes on BLM lands within the watershed). This proposal includes adding 7.2 miles of designated open routes, 5.4 miles of which are mapping corrections. The proposed changes in this alternative are primarily corrections of mapping errors, and responses to changes that have occurred in the area (i.e. routes that were no longer receiving use and/or are difficult to see/find on the ground). Several of the routes being designated as closed are very steep and are causing resource damage and are dangerous due to their deteriorated conditions, while safer and more appropriate routes exist nearby that would provide access to the same area. Unauthorized motorized use is resulting in loss of big game security, riparian degradation, erosion, and spread of noxious weeds. Several other routes identified to be closed to motorized use were determined not to actually exist on the ground, and are corrections of mapping errors. Working with the private companies that provide the GIS referenced maps that are available on smart phones and GPS units would help to improve compliance and help to reduce impacts associated with unauthorized motorized use. By helping to reduce, the unauthorized motorized use there would likely be benefits to the upland health, would reduce wildlife displacements, and improve the recreation/hunting experience for a certain segment of the public that prefers to get away from the motorized use. As in the No Action Alternative, additional educational efforts and the other efforts described in the RMP would be made to improve compliance with the travel restrictions within the area that would hopefully reduce violations and improve hunting opportunities. There would be no impacts to recreation opportunities or public access by making the proposed adjustments. While the proposed route designation changes do not go very far to reduce impacts to wildlife security, or improving the associated recreation experiences (big game hunting away from open routes) the proposed changes would maintain existing recreation opportunities' and public access while reducing impacts on other resources.

In the Bill Hill area, there is a proposal to open .3 miles of primitive road. By designating .3 miles of primitive road as open to motorized use there would be an increase to the route density in the area. Although this route is receiving, use at similar levels to what it would receive if it was currently designated as open. Impacts of opening this route would not be any different from what is ongoing right now.

In the Whiskey Draw area, the proposal is to close .5 miles and open .9 miles of primitive road. This proposal is a simple mapping correction to get what is on the ground to match the maps. The proposed change would not have any impacts.

In the Gallagher Creek area, on-going road braiding occurring. Designating the new route as open and terminating the road braiding would prevent further impacts to the area. Potential impacts to the riparian area from runoff and erosion would be improved through the proposed route change and restoration to the closed routes.

The proposed change in the Henneberry Ridge area is to correct a mapping error to get what is on the ground to match the maps. There would be no changes other than correcting the maps.

South of Clark Canyon, the proposed change would open .88 miles of existing primitive road to motorized vehicle use yearlong. This proposed change would increase road density, potentially displacing wildlife, however this route is likely currently receiving the same amount of use that it would if it were a designated open route. This is a heavily used route that leads to a camping area and overlook.

In the Limekiln Canyon area, the proposal is to correct a mapping error. This would designate two routes (.4 miles and .2 miles) as open to motorized use yearlong. These routes are currently functioning as open, signed as open on the ground and on some of the travel maps. These routes both connect to open routes on both ends of these short segments. Both routes should have been designated as open originally as they are just connecting segments of larger routes.

In the Bell Canyon area, the proposal would close two routes to motorized use (.84 miles). These routes are steep, rocky, and dangerous and are experiencing erosion problems. These routes would require active restoration as well as signs and most likely barricades (rocks, wood, steel, or planting native vegetation) to prevent continued use on them. These routes (transportation linear disturbances) would receive active and passive restoration efforts to prevent continuing use of them. The proposal would open a newly constructed primitive road. This route was originally constructed to install a new pipeline and associated range improvements. This route is significantly better suited for public use; it is safer and provides access to the same areas as the routes that would be closed on this proposal.

In the McKenzie Canyon area, the proposal would open two short cut across routes (primitive roads). These routes total .27 miles combined. These cut across routes are receiving heavy use and the existing closure is very difficult to enforce and nearly impossible to stop. The routes are not known to be influencing any other resources so we determined that the routes should be designated as open.

South of McKenzie Canyon the proposal is to realign roughly .75 miles of primitive road to get the maps to match what is on the ground. There are two routes in this vicinity; one is deteriorating while the other is in good driving condition. This proposal would be to change the route designated as open to the primitive road that is in good condition from the one that is

deteriorating and not being used. This proposal also would include closing .35 miles of route (transportation linear disturbance) to motorized use. This route was intended to be closed but was left open in the BLM mapping system, although the travel maps have been showing it as closed for the past decade. This route is very rocky and in rough shape. The route receives very little use and does not gain additional access to anywhere in particular. Closing this route would help to reduce route density in the area without reducing motorized access. If this route is closed to motorized use, it would receive passive restoration unless regular motorized use is evident.

North of Monida the proposal is to close 3.2 miles of route. This route has been grown over in parts, can be difficult to locate, and is not receiving regular use. This route does not seem to provide access to any specific site or feature. Designating this route as closed would reduce the route density of the area as well as potentially reduce the spread of noxious weeds from people driving it.

The proposals in the East Fork of Little Sheep Creek area would open a short primitive road (.17 miles) that connects two open routes. This route is receiving regular use, designating it as open to motorized use would not cause any additional use of the route or any additional impacts above what currently exists. This proposal also includes closing .25 miles of route (transportation linear disturbance) to motorized vehicle use. This route does not significantly improve motorized access, nor does it access any feature or specific site. Closing this route would help to reduce the route density of the area. Closing this route to motorized use would not have significant impacts to recreation, and may actually improve hunting opportunities' and reduce wildlife displacement caused from the existing motorized use.

The primitive road into the Henneberry House/Ney Ranch Recreation site has a couple of proposed management actions. There are locations off the route that would benefit from revegetation of sagebrush and native grasses as well as physical barriers that would prevent people from driving off road. This proposal is to reduce impacts to cultural sites as well as potential impacts (erosion and sedimentation) to the Beaverhead River. The mowing along the side of the route to prevent drifting would not have any impacts to the existing cultural site and would not occur during waterfowl and migratory bird nesting season (April 15-August 1).

Any riparian, wetland, or aquatic habitat enhancement/restoration projects identified that would have an effect on travel management would have to be analyzed in an additional NEPA analysis. Given the programmatic actions proposed for these projects, site specific affects to travel management could not be analyzed in this EA.

Cumulative Effects

The BLM is not aware of any current or future proposal that would be considered a cumulative impact affecting the travel management in the watershed. The proposals in this EA would allot to no net gain or loss in motorized access on designated open routes.

Resource Concern #5: Visual Resource Management Environmental Effects

Effects common to All Alternatives:

6,676 acres of the Bell-Limekiln Canyon Wilderness Study Area are within the RRLW and are managed as Class I. About 300 acres located west of the Blacktail Mountains WSA is classified as VRM Class II. The remainder of the watershed is classified as VRM Class III.

The Bell-Limekiln Canyon WSA is managed according to VRM Class I objectives. "Preservation of the landscape is the primary management goal in Class I areas. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention." The proposed projects within the WSA would be addressed under Alternatives B and C.

A small portion of the watershed (roughly 300 acres), located west of the Blacktail Mountains WSA on the east edge of the watershed boundary, is classified as VRM Class II. The objective of this class is to retain existing character of the landscape. Activities or modifications of the environment should not be evident or attract the attention of the casual observer. Changes should repeat the basic elements of form, line, color and texture found in the predominant natural features of the characteristic landscape. There are no projects proposed in this VRM Class.

With the exceptions noted above, the remainder of the planning area is managed as VRM Class III. "The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes caused by management activities may be evident but should not detract from the existing landscape." Proposed projects within this EA that would affect visual resources will be discussed below in Alternative B and C.

There are no major projects proposed in any of the alternatives that would exceed visual resource management objectives for any of the areas within the watershed. Changes to the visual characteristics of the landscape throughout the planning area would be consistent with the Visual Resource Management objectives for the area. With or without the vegetation treatments proposed in the action alternatives, the characteristic viewshed will change over time due in part to epidemic insect and disease impacts to the forests. With no management actions, stands of timber would gradually change in color from dominantly green to reddish, brown, and gray. The Class III objective that applies to the majority of the watershed planning area allows for moderate changes to the characteristic landscape, and for management activities that "…may attract attention but should not dominate the view of the casual observer." The various vegetation management actions proposed within the action alternatives would attract attention to varying degrees according to the particular proposal, but none would be likely to "dominate the view of the casual observer" within the context of the overall landscape in this watershed. If no vegetation management actions are taken, gradual changes to the characteristic landscape will be within the visual resource management objectives for this area.

Alternative A – No Action

Natural changes to the visual characteristics of the landscape would continue throughout the planning area that would be consistent with the Visual Resource Management objectives for the area. Without the vegetation treatments proposed in the action alternatives, the characteristic viewshed would change over time through gradual ecological changes. Alternative A would not have any major projects implemented. Therefore, objectives for the various visual resource management classes within this watershed would not be exceeded.

Alternative B

Proposed projects within this EA that would affect visual resource management Class III include a variety of projects with relatively minor anticipated visual impacts, there would also be some projects with more noticeable visual impacts. Minor projects such as barbed wire fences, spring developments, stock water troughs and stock wells, etc. would be consistent with much of the rest of the landscape, largely unnoticed by the casual observer, and are clearly consistent with management objectives for VRM Class III. The larger projects such as commercial timber harvests and conifer encroachment treatments would also remain consistent with management objectives for VRM Class III, as they would not dominate the view or detract from the existing landscape.

Commercial timber harvests and non-commercial timber treatments (mechanical and prescribed fire) for up to approximately 2,374 acres (up to 1,188 acres of commercial timber harvest and up to 1,186 acres of non-commercial treatments) are proposed within the planning area in Alternative B. There are also 13 riparian conifer expansion treatments proposed in Alternative B totaling up to 7.25 miles/0.75 acres. Many of these proposed projects would be within the view of the public along existing open routes. Although the scale of these activities is likely to attract the attention of the casual observer over the short term, it would not likely dominate the view or detract from the existing landscape. Treating more acres would perhaps attract more attention, but would not exceed the threshold to "dominate the view of the casual observer" that would cause the activity to exceed the management objective for the visual resources in this area. In several of the proposed projects, especially for juniper removal along streams and riparian areas, there would be stumps and remnants of the cut conifers left on site. These would not cause the proposed projects to exceed the threshold of the management objectives. Careful routing of any temporary roads, skid trails, and other major disturbances away from county roads or other main travel corridors, and making use of topographical screening would avoid any substantially noticeable visual impacts even over the short term. Within five years of project completion, these treatments would be unnoticeable to most casual observers. Through the life of the projects, these treatments would be within the management objectives for VRM Class III, as they would not dominate the view of the casual observer.

Visual impacts associated with prescribed burning include blackened ground and upright dead trees. These impacts are relatively short term as grasses and forbs respond to the nutrient flush because of fire. Standing dead trees that die by fire generally weather to a light grey color within several years. The length of time these snags remain upright depends on the environmental influences, the integrity of the root system and the tree/shrub species. Mechanical treatments would vary depending on the method used to dispose of slash. Lopping and scattering would result in slash on the ground until it decays. Piling the slash and burning it under high moisture

conditions may result in visible piles for several years. Untreated areas within the upland treatment units would provide some visual obstructions to limit sight distances and would visually break up the treatment continuity. Refer to the photos 4.1 through 4.4 and 4.6 in the chapter four section on Resource Issue 1:Riparian, Wetland and Aquatic Habitat to help visualize the impacts from prescribed burns.

Alternative C

One conifer encroachment treatment (prescribed fire) is proposed in Alternative C within the Bell-Limekiln Canyon WSA (up to 546 acres). These actions would attract attention but they would be performed to preserve the landscape and would return the viewshed to a more natural state. Prescribed fire mimics a natural ecological change. The treated area would attract attention when viewed from the immediate surroundings but would likely not attract attention when viewed from key observation points such as nearby roads. The visual impacts from prescribed burning would be short term duration with spring treatments greening up quickly reducing the duration of the visual impact and fall treatments being covered with snow followed with a rapid spring green up. Impacts from prescribed fire are discussed in further detail in Resource Issue 3: Forest and Woodland Habitat Environmental Effects. The proposed projects would be consistent with the management objectives of VRM Class I.

Cumulative Effects

The impacts from the proposed projects would be in addition to any impacts from completed projects that have occurred in the past ten years. Those projects are consistent with what has been proposed in this EA and the cumulative impacts would not exceed visual resource management objectives for any of the areas within the watershed.

Resource Concern #6: Wilderness Study Areas Environmental Effects

Effects common to All Alternatives:

Wilderness characteristics are expected to be maintained in all areas where they currently exist under all alternatives including the No Action Alternative. There are proposed projects within the Bell-Limekiln Canyon WSA but not within the Maurer Mountain LWC unit; these projects will be analyzed under the Alternatives B & C.

In addition to the proposed projects within the RRLW EA, there are several Non-Commercial Mechanical/Prescribed Fire conifer expansion treatment projects originally proposed in the 2007 RRL Watershed EA that will be carried forward. Since the carry forward projects were analyzed in the previous watershed EA, we will not go into detail of these projects in this analysis. However several of the proposed projects that would occur within the WSA's in Alternative C are very similar in nature, scope and impacts to the projects carried forward.

The BLM manages the WSA in accordance with BLM Manual 6330, Management of BLM Wilderness Study Areas, to ensure that wilderness characteristics are not impaired until Congress can make a final determination on whether to designate the area as wilderness, or release it from further consideration. The BLM will administer the WSA as to not impair the suitability of the WSA for preservation as wilderness.

A small portion, 1872 acres, of the Maurer Mountain LWC unit (MT-050-004N) is within the watershed boundary. Lands with wilderness characteristics are managed in accordance with BLM Manual 6310 – Conducting Wilderness Characteristics Inventory on BLM Lands and BLM Manual 6320- Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process. There are no proposed projects within the LWC Unit.

Alternative A – No Action

Under the No Action Alternative, wilderness characteristics would be maintained in both the Bell-Limekiln Canyon WSA and the Maurer Mountain LWC unit. The imprint of human activity would continue along current trends. Conifers would continue to expand into sagebrush steppe habitat in the absence of fire resulting in a reduction of sagebrush steppe habitat outside the historic range of variability. Cheatgrass and other noxious invasive species may continue to expand, displacing native vegetation in areas within the WSA.

Alternative C

The proposed conifer encroachment project that affects the Bell-Limekiln Canyon WSA in Alternative C is the Limekiln 3 unit, which is up to 546 acres within the WSA. Treatment methods for this alternative would be prescribed fire with no mechanical treatments. The objective for the treatment is to reduce conifer encroachment into sagebrush steppe habitat and are re-introducing a natural process to maintain/restore sagebrush steppe habitat, a fire-dependent ecosystem.

These actions would have a positive effect on the natural quality of the WSA by reducing conifer expansion into the sagebrush steppe habitat. This project would improve the land health and maintain or promote sagebrush steppe habitat. However, some short-term negative impacts would be associated with the project from vehicles, equipment and environmental disturbance from the work activity. Additional short-term impacts to recreation and solitude would be expected but would only last the duration of the project. The long-term positive impacts to the wilderness character of improving natural conditions would outweigh the short-term negative impacts.

BLM Manual 6330—Management of BLM Wilderness Study Areas states, "Actions that clearly benefit a WSA by protecting or enhancing these characteristics are allowable even if they are impairing…" The proposed conifer treatments would enhance the characteristics of the WSA; therefore, this project would meet the exception to the non-impairment standard spelled out in section 1.6.C.2.f (page 1-12 and 1-13) of the BLM Manual 6330. BLM Manual 6330 goes into further detail of prescribed fire in Section 1.6.D.2.c.i "Use of prescribed fires in WSAs is limited to instances where this use meets the non-impairment standard or one of the exceptions, such as to clearly protect or enhance the land's wilderness characteristics. The BLM may utilize prescribed fire in WSAs where the natural role of fire cannot be returned solely by reliance on wildfire…" (BLM WSA Manual 6330). The proposed prescribed fire conifer treatments would be consistent with management of the WSA according to BLM Manual 6330.

Cumulative Effects

The Cumulative Impacts would also include the up to 1,129 acres of noncommercial mechanical/prescribed fire treatments that have occurred since the 2007 RRLW EA and/or that will be carried forward and implemented after this EA is completed.

Resource Concern #7: Cultural and Paleontological Resources Environmental Effects

Effects common to All Alternatives:

The BLM will manage cultural and paleontological resources in accordance with the 2006 Dillon RMP and BLM 8100 Manual Series guidance and will continue to work on reducing imminent threats from natural or human-caused deterioration, or potential conflict with other resource uses, by identifying areas for new field inventory and site protection measures. Given the numerous laws, regulations, and policies that govern the management of cultural and paleontological resources on federal lands that would apply under every alternative, significant differences in the impacts to cultural and paleontological resources by alternative are not expected. However, given the lack of inventory data, there is some risk of impacts to cultural and paleontological resources under each alternative that varies in proportion to the number of projects and size of projects in each alternative. Risk of impacts is minimized by requiring inventory before issuing authorizations for projects and requiring that impacts to historic properties and paleontological sites be avoided by project redesign or abandonment, or, if necessary, mitigation. All project authorizations would be done in compliance with Section 106 of the National Historic Preservation Act, Paleontological Resources Preservation Act of 2009, and other applicable cultural resource laws.

Alternative A – No Action

Under Alternative A, adverse impacts to cultural resources from travel management issues would continue. Cultural and paleontological resources would continue to be managed in accordance with the 2006 Dillon RMP as amended and BLM 8100 Manual Series guidance.

Alternative B

Under Alternative B, ground disturbance resulting from timber harvest, temporary road construction, prescribed fire, non-commercial mechanical treatments, new pipelines and stock water troughs, and riparian vegetation treatment projects is the primary threat to cultural and paleontological resources. Range improvement projects, riparian vegetation treatments, prescribed fire/non-commercial mechanical vegetation treatments, and commercial forest treatments could represent a risk of impacts to cultural resources under Alternative B, given the greater number of acres proposed for vegetation treatment projects and greater number of range improvement projects. Nonetheless, under Alternative B, new and previously identified cultural and paleontological resources would be identified, recorded, and managed in order that known threats to these resources would be avoided or mitigated, if necessary, during project-level planning and implementation.

Travel management can have both indirect and direct impacts to cultural and paleontological resources. Driving over cultural and paleontological sites can result in direct damage by destroying cultural features, artifacts, vegetation and inorganic surface crusts, causing erosion and compaction, and altering soil stratigraphy. Indirect impacts include increasing visibility of resources which can lead to unauthorized collection, increased looting, and vandalism. Cultural resources that are currently being negatively affected by travel management issues would benefit under Alternative B, by restricting vehicle use to the designated route.

The proposed projects for livestock management, stream restoration and/or enhancement, and vegetation treatments under Alternative B would benefit cultural and paleontological resources because new inventory would identify the location of cultural and paleontological resources and there would be the opportunity to implement project design features to enhance the protection of cultural and paleontological resources. Examples include livestock exclosure fences to protect multiple resources and stream enhancement projects may decrease archaeological site erosion. Also, decreasing hazardous fuel loads and improving land health would ultimately aid in the long term protection of important cultural resource values.

Alternative C

Under Alternative C, the risk of impacts to cultural and paleontological resources from range improvement projects, riparian vegetation treatments, and commercial forest treatments would be less than Alternative B, given the substantial reduction in the number of projects; however, the negative impacts from travel management issues on cultural resources would continue and there could be potentially more risk of impacts to cultural resources from prescribed fire/mechanical vegetation treatment projects given the greater number of units and acres treated. Nonetheless, under Alternative C, new and previously identified cultural and paleontological resources would be identified, recorded, and managed in order that known threats to these resources would be avoided or mitigated, as necessary, during project-level planning and implementation.

Alternative D

Under Alternative D, impacts to cultural and paleontological resources would be the same as the Alternative A. Under Alternative D, adverse impacts to cultural resources from travel management issues would continue. Cultural and paleontological resources would continue to be managed in accordance with the 2006 Dillon RMP as amended and BLM 8100 Manual Series guidance.

Cumulative Effects

Cumulative impacts over time can include inadvertent damage to resources, loss of sites prior to development of better research techniques, loss of interpretive values, and incremental loss of the cultural and paleontological resource base. Livestock management, prescribed fire, vegetation treatment, stream restoration, and travel management projects may cause surface disturbance, bring additional people in contact with cultural and paleontological resources, or affect the fabric of historic structures and culturally modified trees. However, differences in cumulative impacts to cultural and paleontological resources under the different alternatives as a result of authorized land management projects would be low because of project- and site-specific protection measures. New inventory would lead to more cultural and paleontological resources being identified and a reduction of adverse cumulative impacts caused by natural processes and human-made actions after these resources are brought under management.

Mitigation and Residual Effects

There are a variety of methods to eliminate or minimize effects on cultural and paleontological resources. Projects can be modified to avoid cultural and paleontological resources. Scheduling projects when the ground is frozen and/or covered with snow can reduce soil compaction and disturbance to resources. Restricting vehicle travel to open routes through physical barriers and exclosure fences are other protective measures. Protective wrap around historic buildings can be used during prescribed fire treatments. In addition, site recording and monitoring, informational

sign posting at important cultural resources, and stabilizing sites suffering from erosion are appropriate methods to minimize effects to cultural and paleontological resources. If impacts to cultural and/or paleontological resources cannot be eliminated or minimized, then project abandonment or mitigation would be required. Types of mitigation, depending on site-specific and project-specific conditions, could include data recovery/excavation, in-depth recordation of historic buildings/structures (Level II documentation), and/or off-site mitigation. No residual effects to cultural and paleontological resources after mitigation measures have been implemented are expected.

Chapter 5 Consultation and Coordination

Introduction

In the spring of 2017, the Dillon Field Office sent letters to individuals, groups, businesses, and Native American tribal leaders that were on the mailing list for the 2008 Red Rock Lima Watershed Assessment, notifying them a new assessment would be conducted in the summer of 2017. In addition, all grazing permittee's/leassee's and base property owners were sent a letter a similar letter. These notices were followed by media releases, which were published and aired. The assessment report was released in December 2017. During the release media outlets were notified, and public service announcements were made. The BLM mailed all grazing operators and base property owners copies of the assessment report. All other groups and individuals who requested copies were provided copies. The BLM requested comments on the assessment report by January 31, 2018.

BLM did receive comments on the assessment report. The comments were carefully reviewed, and where applicable clarification was provided in this EA. Comments were also used in the development of alternatives. In addition, BLM specialists met with grazing operators, other agencies, and local biologists numerous time to discuss resource management, and to develop alternatives.

This EA was released for public comment on May 21, 2018, and was also placed on the BLM's ePlanning website.

Persons, Groups, and Agencies Consulted

In addition to the grazing operators, the following were consulted during the development of this EA:

Chuck Maddox-Montana DNRC
Tim Egan- Montana DNRC
Kyle Scmidtt- USFS
Breck Hudson-USFS
Dean Waltee- MFWP
Craig Fager- MFWP
Zach Owen, Beaverhead Watershed Committee
Matt Jaeger, MFWP

Tribes with tribal treaty interests and/or traditional connections to southwest Montana were notified of the RRLW assessment. For scoping, a formal letter soliciting comments was sent to the Blackfeet Nation, Confederated Salish and Kootenai Tribes of the Flathead Reservation (CSKT), and the Shoshone Bannock Tribes on December 22, 2017. The RRLW assessment was also discussed during tribal coordination meetings with the CSKT on April 10, 2018 and Shoshone Bannock Tribes on May 9, 2018. A formal letter inviting the tribes to comment on the draft EA was sent on May 22, 2018.

List of Preparers[1]

Name	Title	Resource Area
Dustin Crowe	Rangeland Management Specialist	ID-Team leader, Uplands- Sagebrush and Grassland Habitat
Pat Fosse	Assistant Field Manager (Renewable Resources)	Appendix B-monitoring plan, EA Technical Review
Katie Benzel	Wildlife Biologist	Special Status Species- Wildlife
Sean Claffey	Hydrologist	Riparian, Wetland, Aquatic Habitat
Ashley Durham	Forestry Technician	Forest and Woodland Habitat
Emily Guiberson	Forester	Forest and Woodland Habitat
Shannon Gilbert	Archeologist	Cultural Resources and Paleontological Resources
Chris McGrath	Outdoor Recreation Planner/Wilderness	Travel Management, Wilderness Study Areas, VRM
Kelly Savage	Rangeland Management Specialist	Special Status Species- Plants
Laurie Blinn	GIS Specialist	GIS
Joe Sampson	Fire Management Specialist	Non-Commercial, Mechanical/ Prescribed Fire
Michael Mooney	Weeds Specialist	Noxious and Invasive Species
Paul Hutchinson	Fisheries Biologist	Fisheries and Aquatic Habitat

[1] Not a signature/approval page.

Glossary

Anthropogenic: Caused or influenced by humans.

Bankfull stage: "The bankfull stage corresponds to the discharge at which channel maintenance is most effective, that is, the discharge at which moving sediment, forming or removing bars, forming or changing bends and meanders, and generally doing the work that results in the average morphologic characteristics of channels." Dunne and Leopold (1978).

Channel stability: the ability of the stream, over time, to transport the flows and sediment of its watershed in such a manner that the dimension, pattern and profile of the river is maintained without either aggrading nor degrading.

Critical Shear Stress: For a fluid to begin transporting sediment that is currently at rest on a surface, the boundary (or bed) shear stress τ_b exerted by the fluid must exceed the critical shear stress τ_c for the initiation of motion of grains at the bed. This is typically represented by a comparison between a dimensionless shear stress (τ_b*) and a dimensionless critical shear stress (τ_c*). The nondimensionalization is in order to compare the driving forces of particle motion (shear stress) to the resisting forces that would make it stationary (particle density and size). This dimensionless shear stress, $\tau*$, is called the Shields parameter. Critical shear stress: the Shields diagram empirically shows how the dimensionless critical shear stress required for the initiation of motion is a function of a particular form of the particle Reynolds number, Re_p or Reynolds number related to the particle.

Entrenchment: the vertical containment of river and the degree to which it is incised in the valley floor.

Entrenchment ratio: a quantitative expression of the ratio of the flood prone width to the bankfull width.

Flood prone width: width measured at an elevation which is determined at twice the bankfull depth.

Functional at risk (FAR): riparian wetland areas that are functional, but an existing soil, water, or vegetation attribute makes them susceptible to degradation.

General Habitat Management Areas (GHMA): Encompass habitat that is outside of Priority Habitat Management Areas (PHMA). GHMA contain approximately 10 percent of the occupied leks that are also of relatively low male attendance compared to leks in PHMA. GHMA are generally characterized by lower quality disturbed or patchy habitat of low lek connectivity.

Greenline: that specific area where a more or less continuous cover of vegetation is encountered when moving away from the center of an observable channel. The greenline is often, but not necessarily, located at the water's edge.

Hummocking: a form of micro-topographic relief characterized by raised pedicels of vegetated soil as much as 0.6 m (2ft) higher than the surrounding ground which results from long term large animal trampling and tracking in soft soil. Vegetation on the pedicels usually differs from that on the surrounding lower area due to moisture difference between the two levels. Hummocking is also caused by abnormal hydrologic heaving.

Hydric soil: soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part.

Hydrophyte: Any plant growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.

Hydrologic Unit: The USGS has developed a system of geographic units based upon watersheds. These units were originally subdivided to four levels. Subsequently two additional subdivisions have been developed. Currently there are six levels, with the sixth being the smallest unit.

Lentic: standing or still water such as lakes and ponds

Lotic: flowing or actively moving water such as rivers and streams.

Mesic: of an environment containing moderate amount of moisture as compared to hydric and xeric.

Priority Habitat Management Area (PHMA): PHMA have the highest conservation value for greater sage grouse, based on the presence of larger leks, habitat extent, important movement and connectivity corridors, and winter habitat. They include adequate area to accommodate existing land uses and landowner activities.

Pugging: the small depressions and areas of compaction in saturated soils caused by the hoof action of animals.

Riparian zone: the banks and adjacent areas of water bodies, water coursed, seeps, and springs whose waters provide soil moisture sufficiently in excess of that otherwise available locally so as to provide a moister habitat than that of contiguous flood plains and uplands.

Rosgen Classification System: A classification system for natural rivers in which a morphological arrangement of stream characteristics is organized into relatively homogeneous stream types. Morphologically similar stream reaches are divided into 7 major stream type categories that differ in entrenchment, gradient, width/depth ratio, and sinuosity in various landforms. Within each major category are six additional types delineated by dominant channel materials from bedrock to silt/clay along a continuum of gradient ranges.

Spring brook: a channel that carries water from a spring. Where there is sufficient flow, the channel forms a perennial stream. Frequently in arid environments, the flow is insufficient to create a perennial stream. Groundwater emerges at the springhead, flows a short distance within the spring brook, and then submerges.

Stream power: **Stream power** is the rate of energy dissipation against the bed and banks of a river or stream per unit downstream length. It is given by the equation: $\Omega = \rho g Q S$ where Ω is the stream power, ρ is the density of water (1000 kg/m^3), g is acceleration due to gravity (9.8 m/s^2), Q is discharge (m^3/s), and S is the channel slope. **Unit stream power** is stream power per unit channel width, and is given by the equation: $\omega = \frac{\rho g Q S}{b}$ where ω is the unit stream power, and b is the width of the channel. Stream power is used extensively in models of landscape evolution and river incision.

Total Maximum Daily Load (TMDL): The goal of the Clean Water Act (CWA) is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Under section 303(d) of the CWA, states are required to develop lists of impaired waters. The law requires that states establish priority rankings for waters on the lists and develop TMDLs for these waters. A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still safely meet water quality standards.

TMDL Planning Areas: Montana DEQ is using a watershed approach to address TMDLs based on the premise that water quality restoration and protection are best addressed through integrated efforts within a defined geographic area. DEQ has divided the state into 91 watershed planning areas to facilitate development of TMDL/water quality restoration plans.

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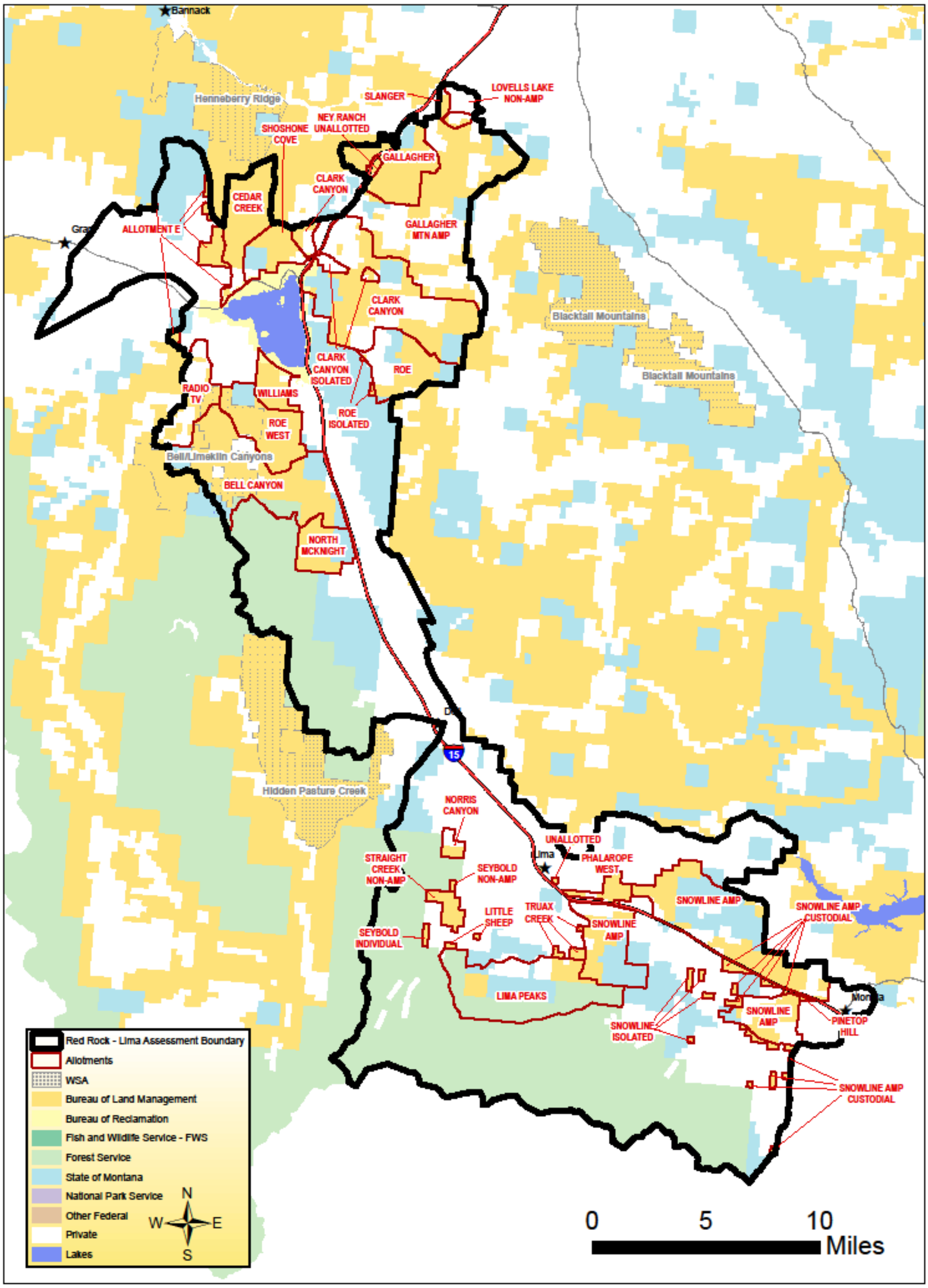
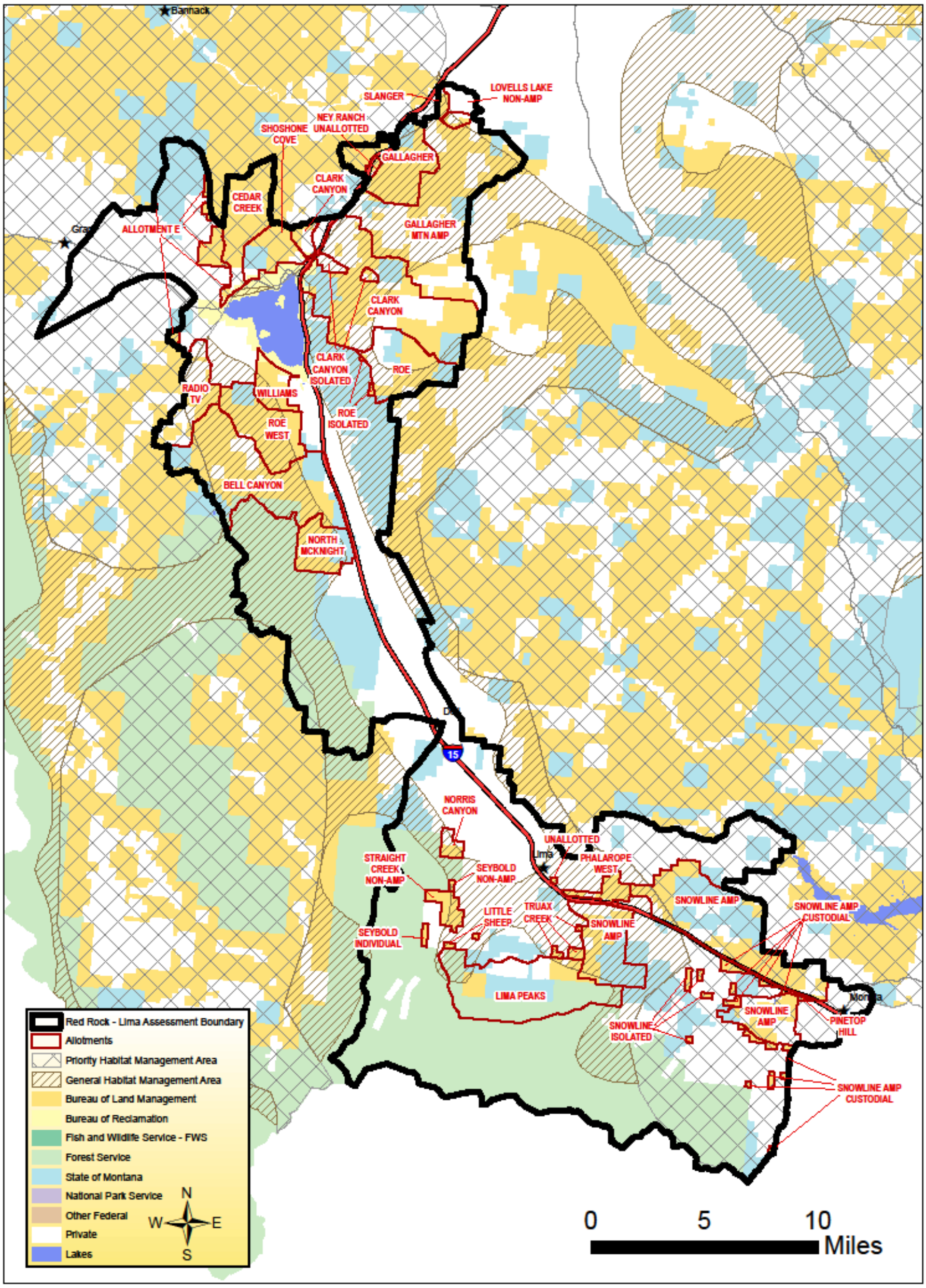
Chapter 6 Appendices

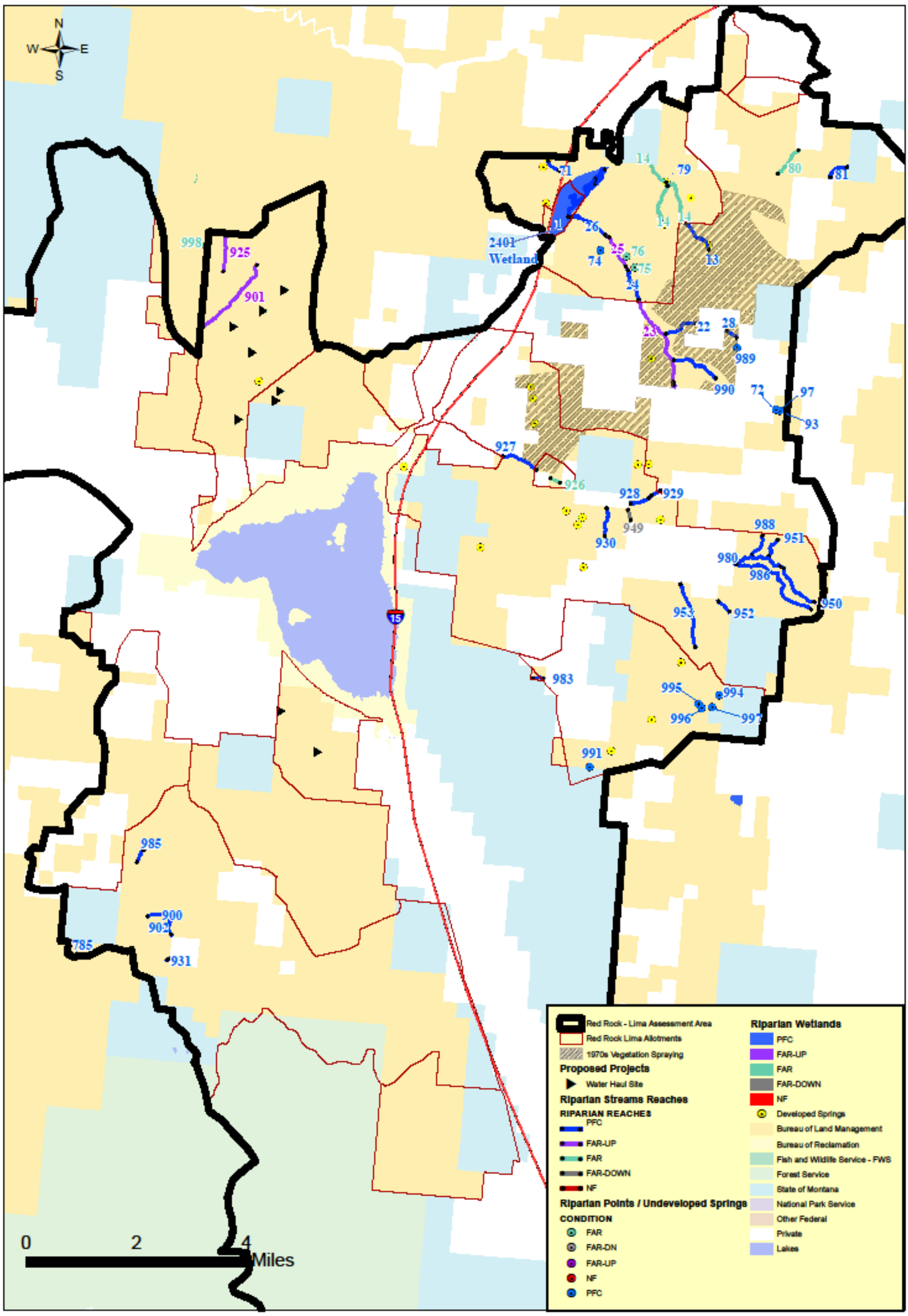
APPENDIX A
MAPS



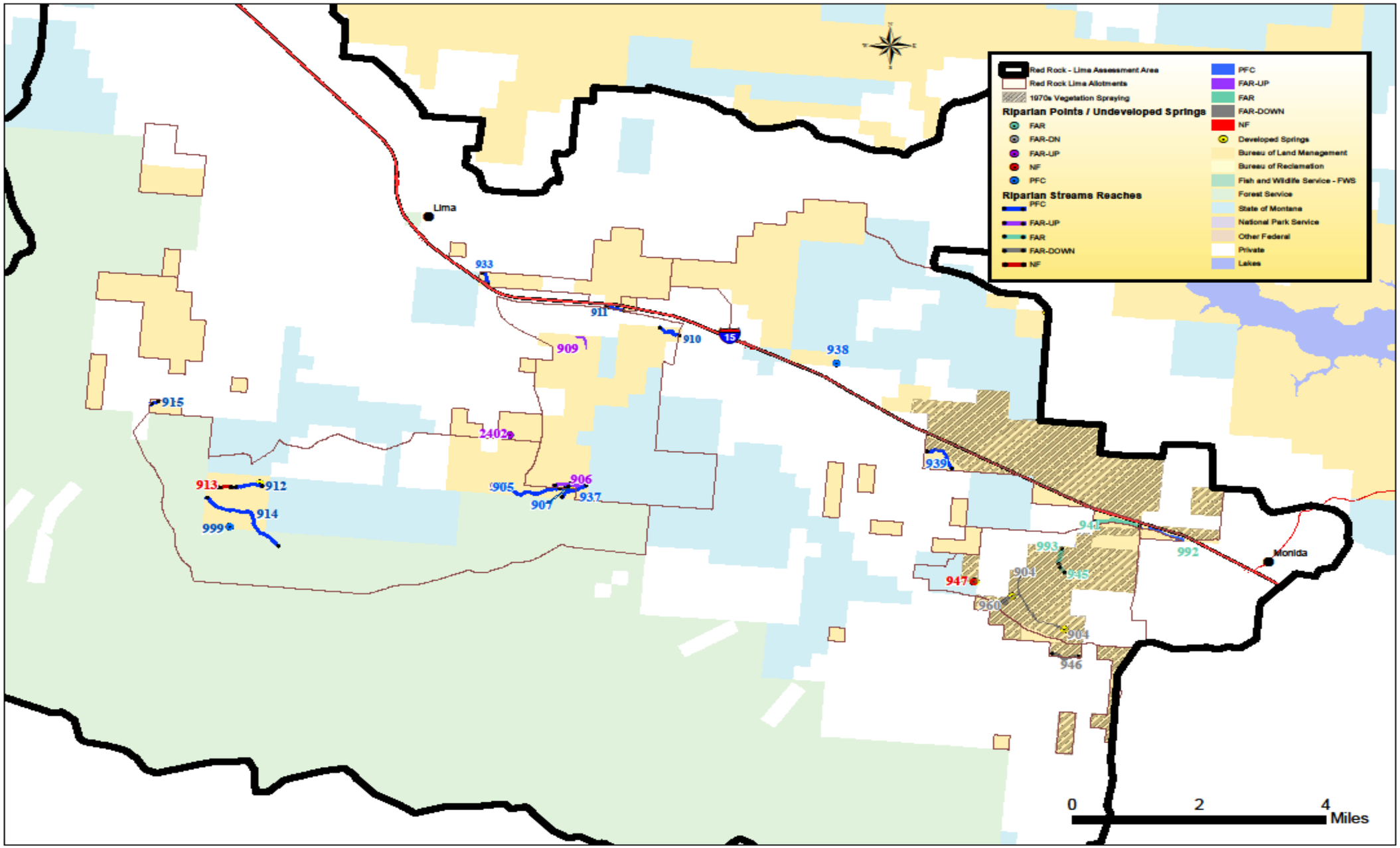
Map 1 - Red Rock - Lima Assessment Area and Allotments



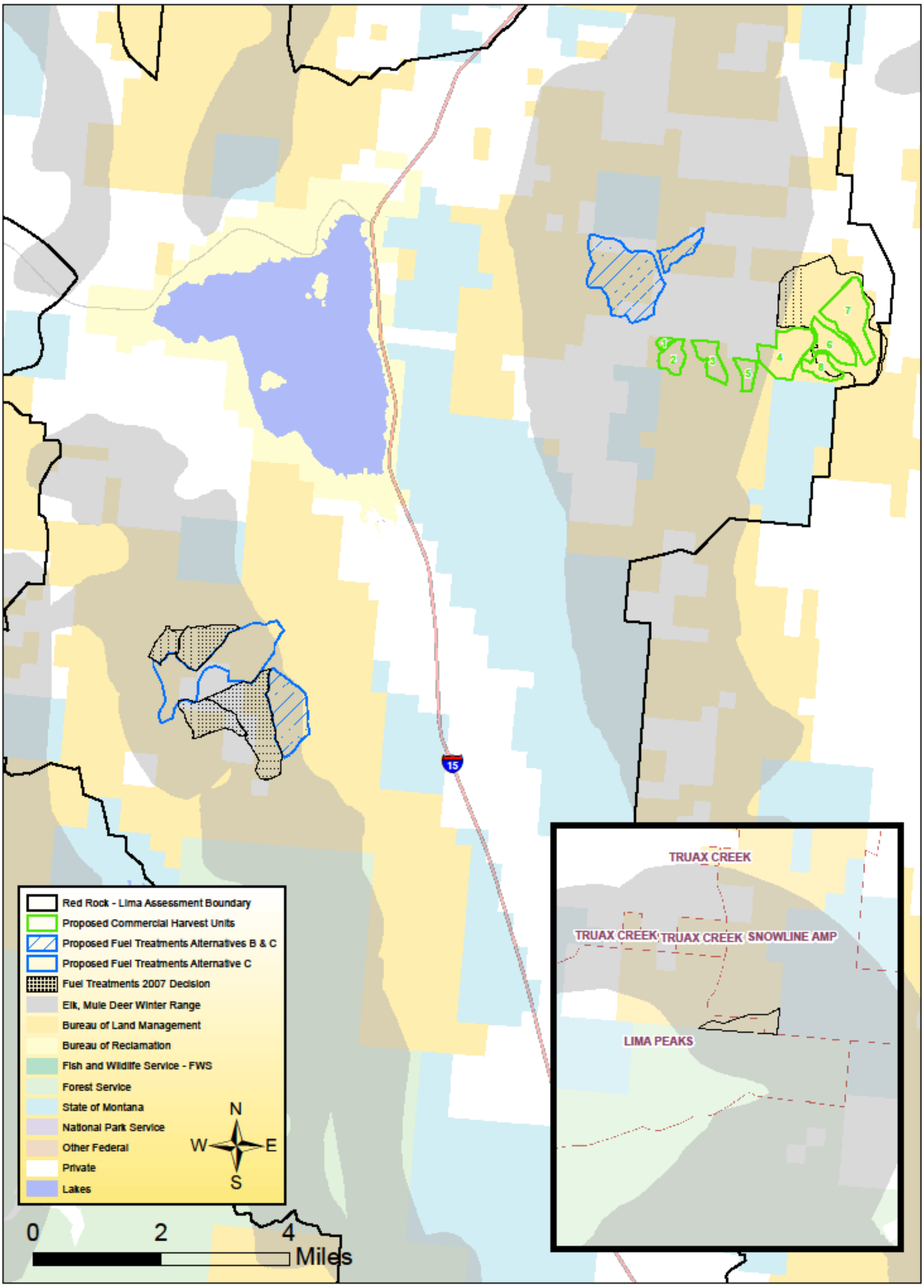
Map 2 - Red Rock - Lima Sage Grouse Management Areas



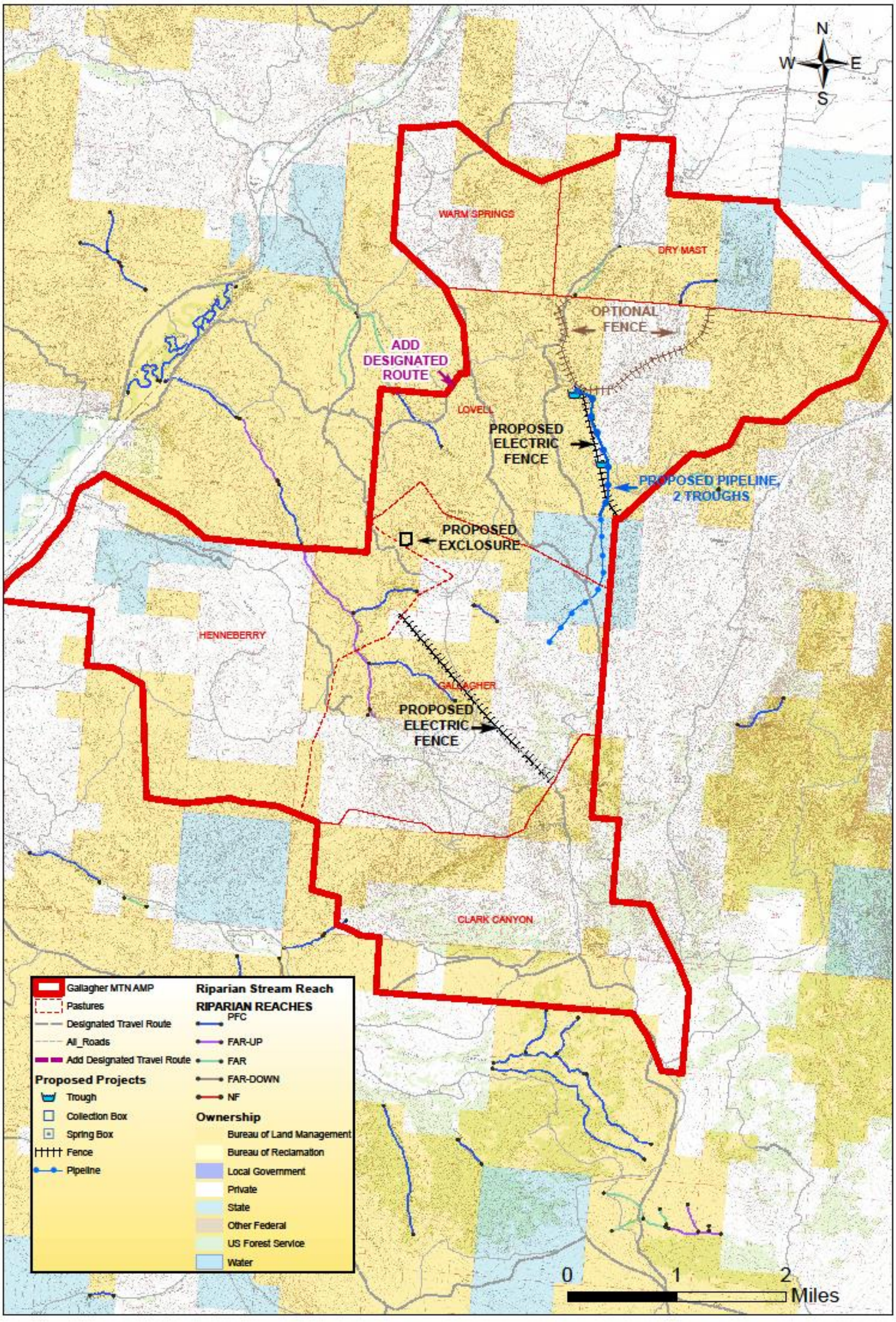
Map 3 - Red Rock - Lima North Half
Riparian Reaches, 1970's Vegetation Spraying



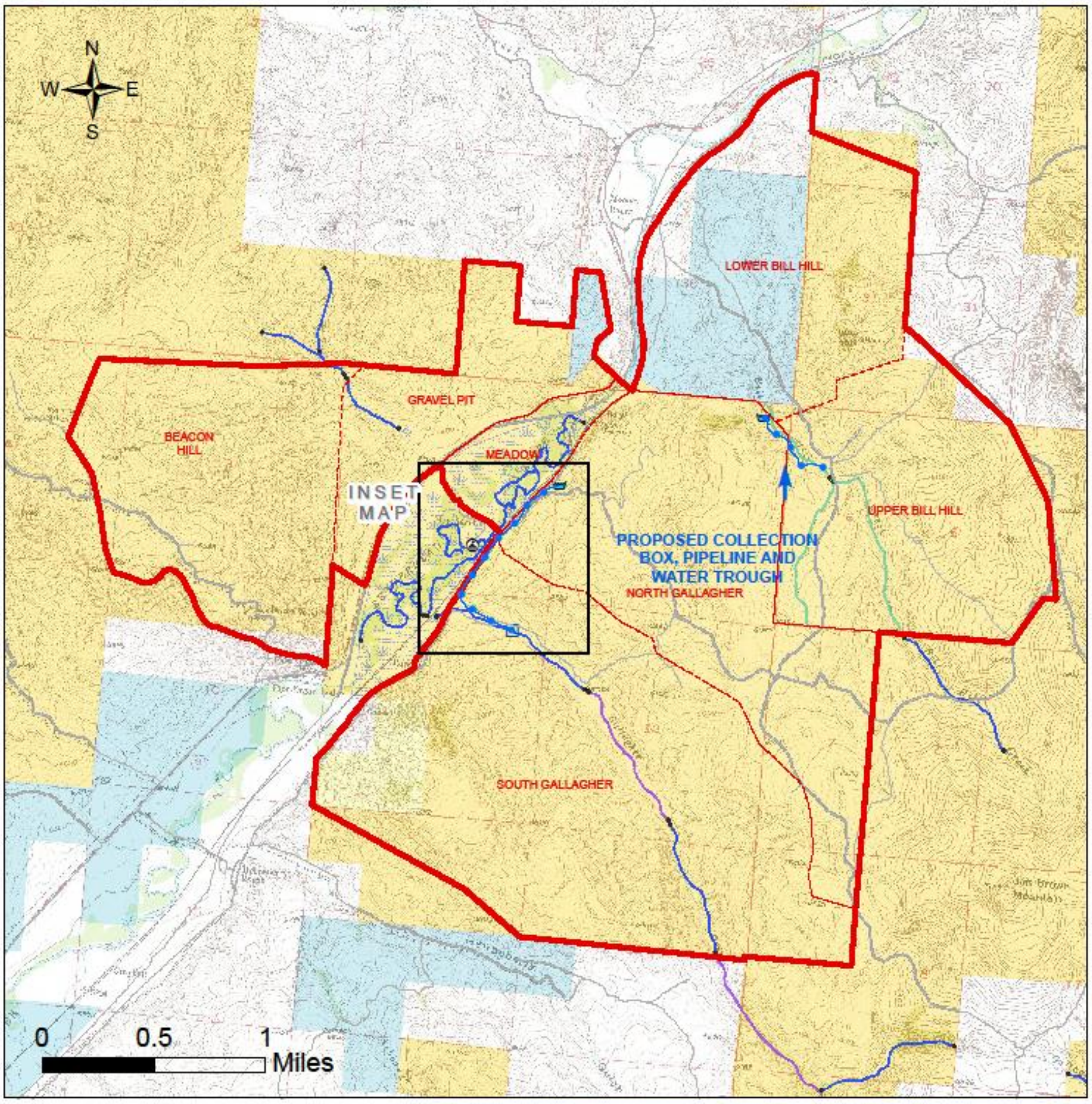
Map 4 - Red Rock - Lima South Half
Riparian Reaches ,1970's Vegetation Spraying

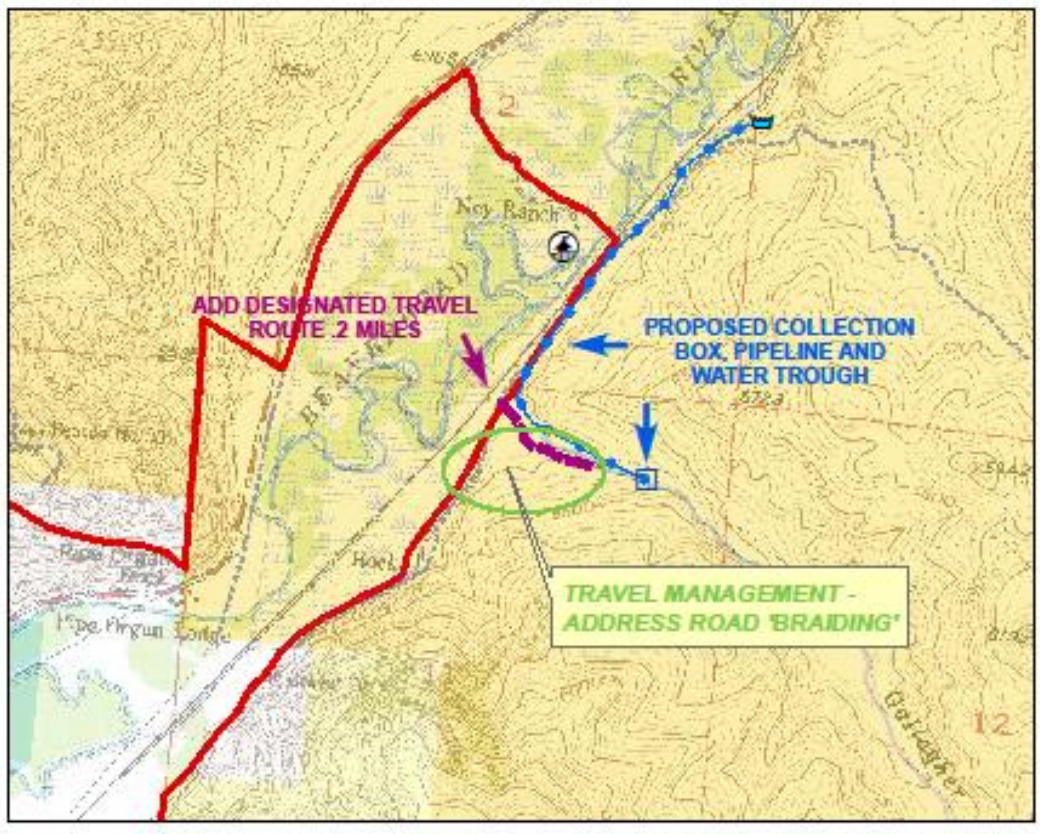


Map 5 - Proposed Non-Commercial Mechanical/Prescribed Fire Treatments and Commercial Harvest

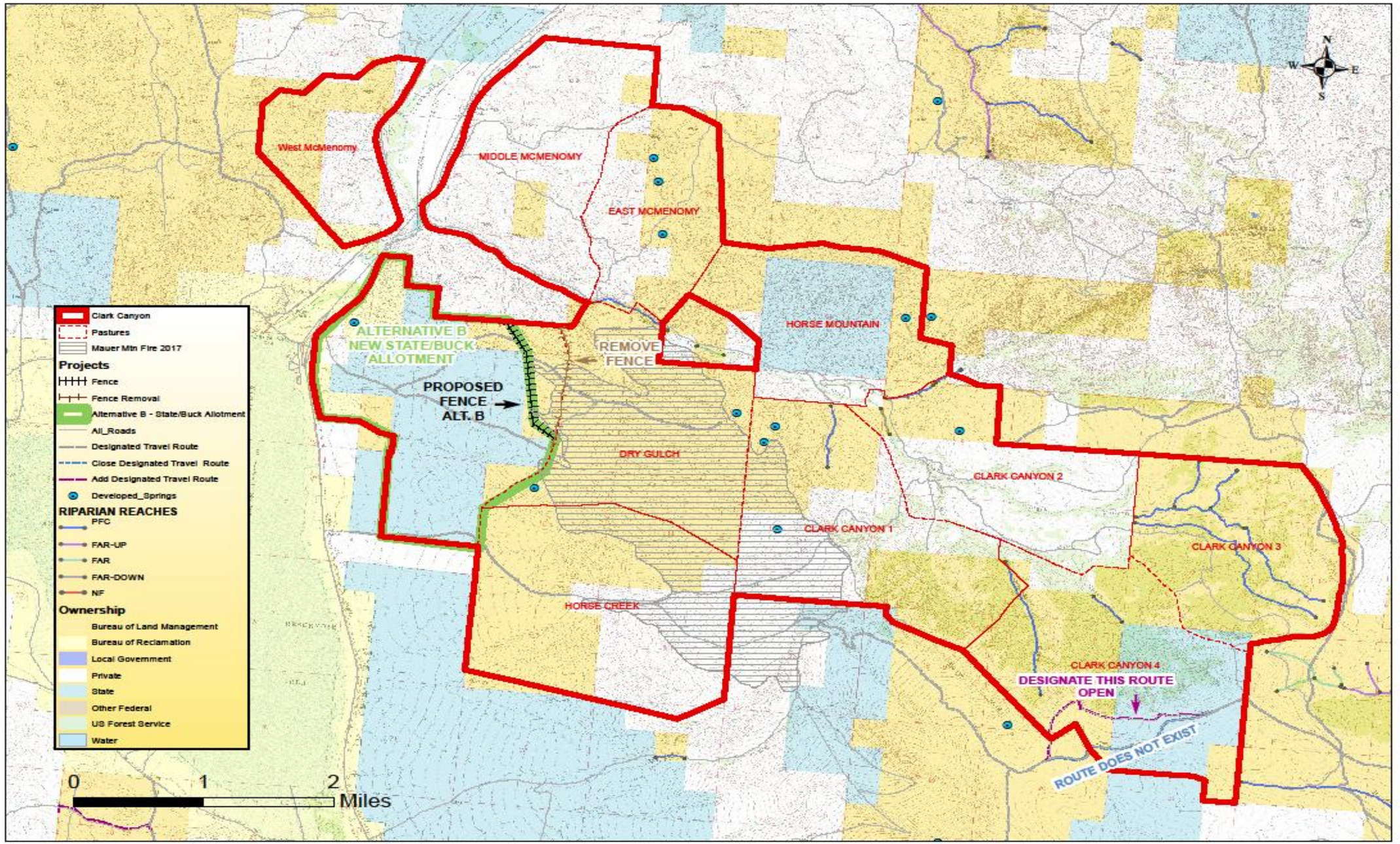


Map 6 - Gallagher Mtn AMP - 30013
Proposed Projects,Travel Management

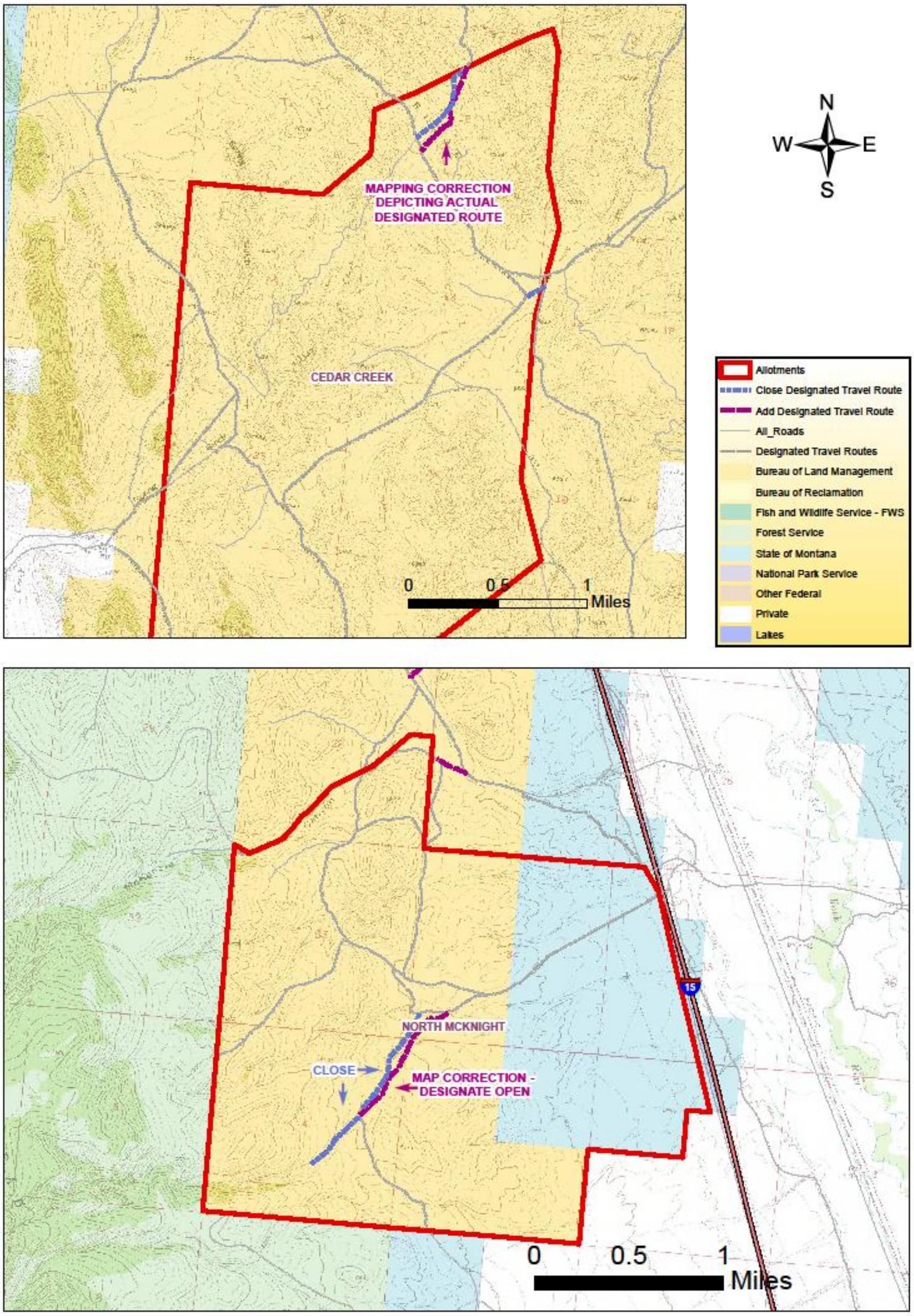




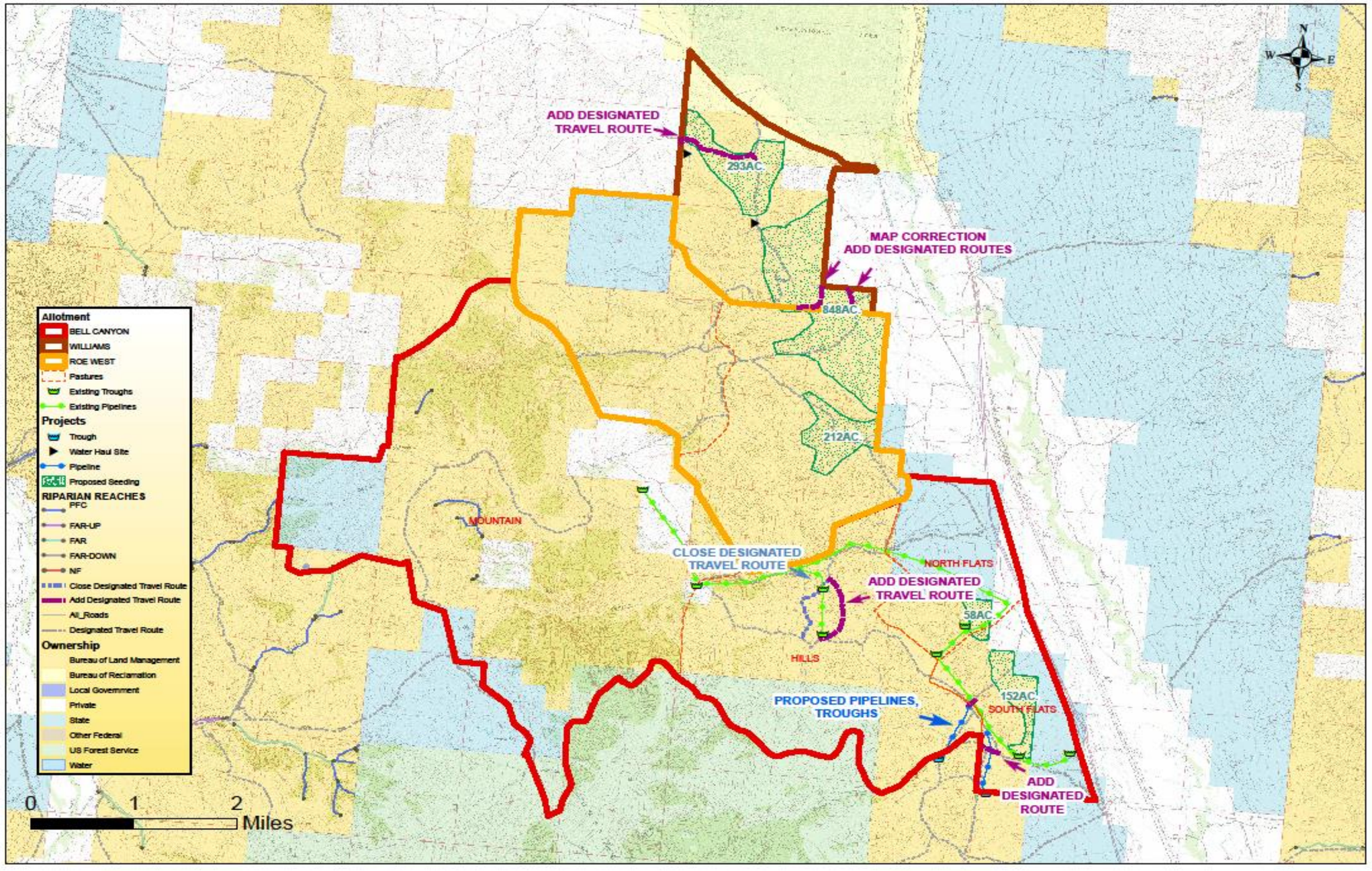
Map 7 - Gallagher - 20114 - Proposed Projects



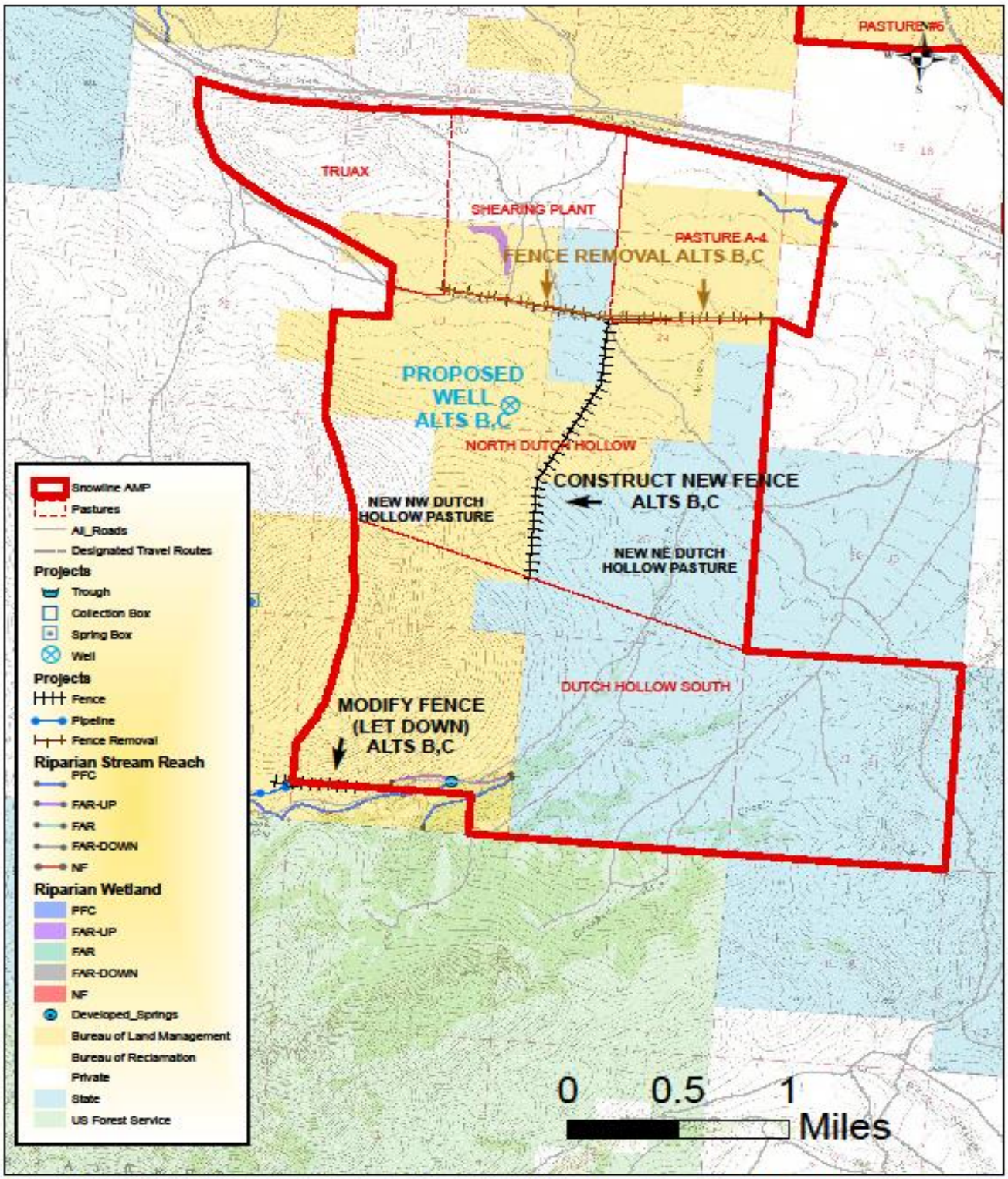
Map 8 - Clark Canyon - 30002 Proposed Projects, Travel Management, New State/Buck Allotment, Alternative B



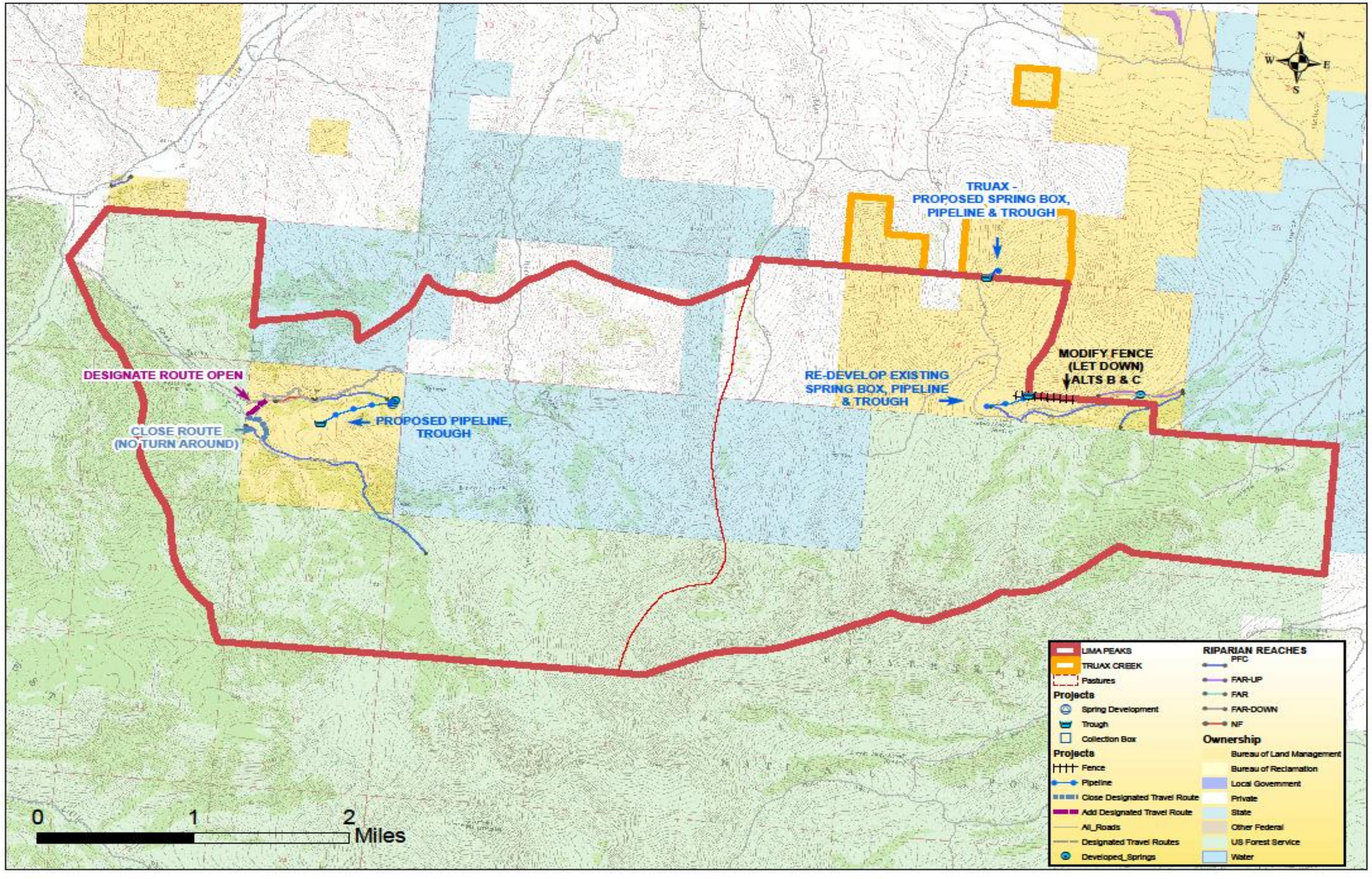
Map 9 - Cedar Creek - 10124 and North McKnight - 20746 Travel Management



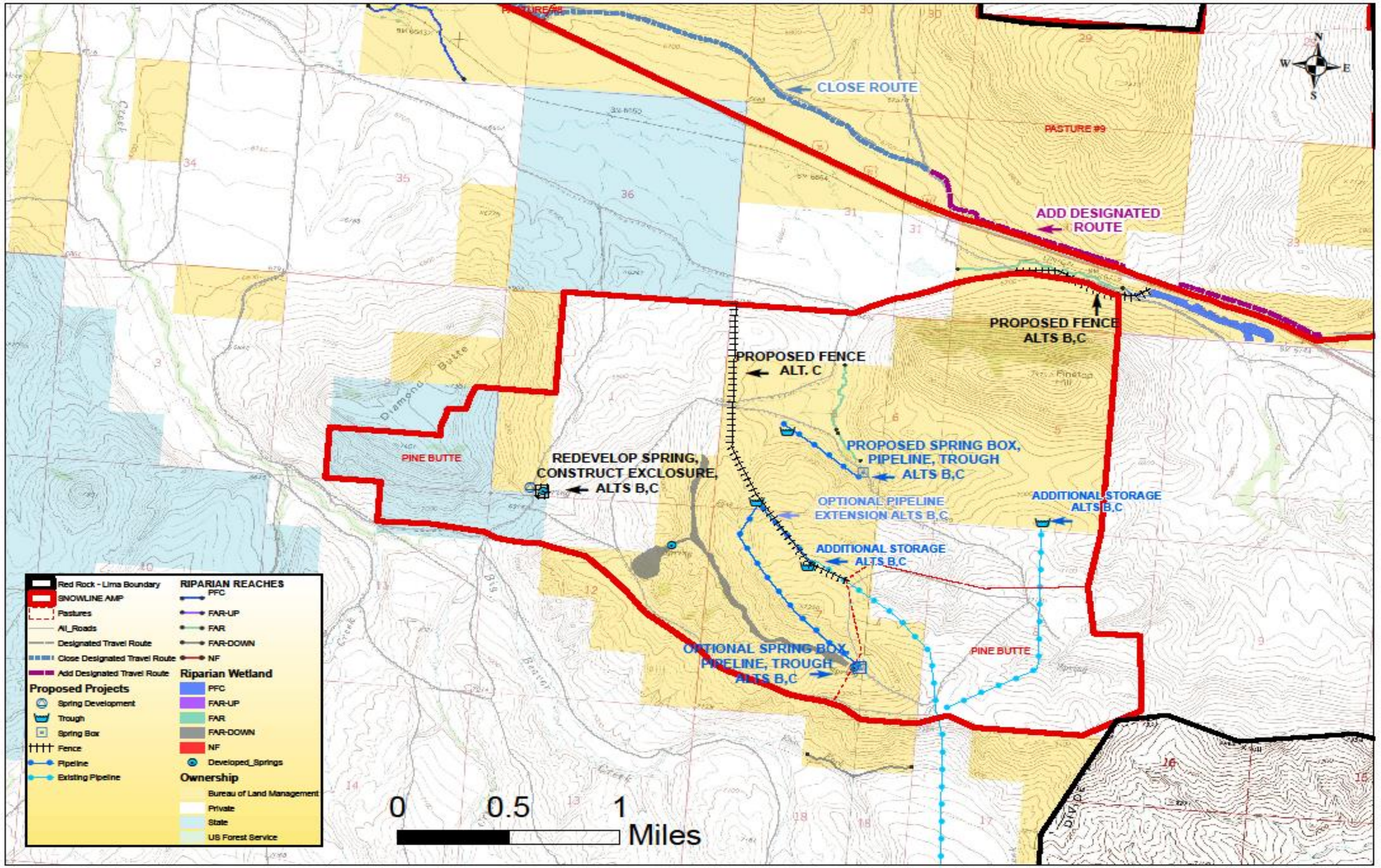
Map 10 - Bell Canyon - 20193, Williams - 20195, Roe West - 20728
Proposed Projects, Travel Management



Map 11 - Snowline AMP - 30029 - Dutch Hollow Unit
Proposed Projects Alternatives B & C



Map 12 - Lima Peaks 30270, Truax Creek 20642
Proposed Projects,Travel Management,



Map13 - Snowline AMP (South) - 30029 - Pine Butte Unit Proposed Projects, Travel Manaagement

Appendix B

Red Rock/Lima Watershed

Monitoring Plan

Monitoring Plan for Red Rock/Lima Watershed

Introduction

The purpose of this resource monitoring plan is to measure the effectiveness of existing management, where applicable, and management changes, structural projects and vegetative treatments in meeting the goals and objectives developed for the Red Rock/Lima Watershed (RRLW). This plan has been designed to measure progress towards site specific objectives developed by an ID team where resource concerns were identified during the Red Rock/Lima Watershed Assessment. This plan will identify when, where and how studies will be conducted, as well as the types of data that will be collected, how the data will be evaluated, and who will participate in the process. All monitoring methodologies are approved BLM monitoring methodologies and are described in various BLM or Interagency Handbooks. This information, including technical references, BLM policy and procedure handbooks, and monitoring guidelines and methodology descriptions are available for review at the Dillon Field Office. Technical references and BLM procedural handbooks are also available on the BLM library website.

All ***existing*** monitoring studies that are needed to measure progress towards objectives or Standards will continue to be re-read on the same time schedule as any identified new studies. In addition to the watershed and site specific monitoring, Assessment, Inventory and Monitoring (AIM) transects were established during 2016 and will be read at five year intervals to measure Land Use Plan Effectiveness at the watershed scale. The AIM plots are randomly generated plots that measure land health relative to site potential. This methodology is being implemented across the BLM in a consistent manner to indicate land health at multiple scales. The information from these plots is available to the public on the TerraDat web page. Additional AIM plots may be established in the future to monitor the effectiveness of proposed land treatments.

Site Specific Objectives

Three Resource Issues and seven additional Resource Concerns were identified during the Red Rock/Lima Watershed Assessment and through public scoping and were analyzed in the Red Rock/Lima Watershed Environmental Assessment (EA). Objectives have been developed based on each key issue and resource concern. The amount of change desired for each of the objectives will be determined once additional baseline data is gathered during the 2018 or 2019 field season. The goal is to make measurable progress towards site specific objectives to be able to meet all Rangeland Health Standards and site specific objectives by 2027.

Key Issue # 1: Riparian, Wetland, and Aquatic Habitat

Objectives:

- Increase composition and cover of deep-rooted riparian species along stream channels and spring/wetland areas (reduce bare ground).
- Increase vigor and regeneration of aspen and other riparian deciduous tree and shrub species.
- Restore, maintain and/or improve physical condition of stream channel/streambanks (i.e. channel dimensions and streambed composition within expected range given channel type and position on landscape).
- Stop head cuts and restore vertical channel stability.
- Restore, maintain and/or improve floodplain connection by reducing channel entrenchment.
- Reduce sediment inputs into streams generated by human activities.
- Restore, maintain and/or enhance native vegetation and hydrology of springs, seeps and wet meadows with emphasis on ecological function and biodiversity.

Monitoring activities to measure progress towards meeting Riparian, Wetland and Aquatic Habitat objectives:

- Continue monitoring existing riparian studies to measure progress towards objectives.
- Springs that are developed/redeveloped will be photographed before and after development and inspected and photographed periodically after development (every 2-3 years), including prior to the next scheduled assessment.
- Spring developments will be checked at least annually during compliance inspections to verify that maintenance is being completed as agreed to in Cooperative Agreements.
- Dysfunctional spring developments that are removed/cleaned up will be photographed before and after project clean-up.
- New culverts, hard water crossings or water gaps will be photographed before and after implementation of the projects.
- Any wetland or mesic/wet meadow restoration projects will be monitored by delineating the extent of current wetland vegetation or mesic vegetation; and/or setting up vegetation transects perpendicular to the existing edge that extend from outside the current wetland into treated wetlands or wet meadow, setting up vegetation transects completely within the treated areas perimeter, completing production studies before and after restoration projects, and/or setting up photo points to measure vegetative changes within and adjacent to the wetlands or wet meadows and overall effectiveness of the restoration projects.
- Wetland and wet meadow habitat will also be monitored through aerial photos to determine if they are increasing or decreasing in size. We will explore the use of Normalized Difference Vegetation Index (NDVI) in detecting changes in the affected drainages.
- Stream restoration projects will be monitored by establishing MIM, Greenline Transects, Greenline to Greenline Width transects and/or photo points. Where grade control or induced meandering is implemented a longitudinal profile will be surveyed pre-project and a site specific schedule for repeat surveys will be developed to measure change and bed slope and depositional patterns.
- Where riparian conifer treatments were previously completed, post treatment greenline transects will be attempted as juniper slash allows access.

- Where new riparian conifer treatments are proposed (Table 2.6) greenline transects and photo points will be established on each reach.

Table 1: Additional Site Specific Riparian and Wetland and Aquatic Habitat Monitoring

Allotment Name and #	Stream or Wetland and Number	Objective	Monitoring Methodology
Clark Canyon #30002 (I)	*Clark Canyon #949-0.3 mi. FAR-DN	Increase deep-rooted riparian vegetation (sedges, willows) Improve width/depth ratio Mitigate entrenchment where applicable.	Greenline transect; cumulative width/depth transect; measure entrenchment ratio; and/or photo points
Clark Canyon Isolated #20206 (C)	*Clark Canyon #926-0.3 mi. FAR	Improve width/depth ratio, mitigate entrenchment, increase sinuosity, increase deep-rooted riparian vegetation along the greenline	Longitudinal profile, greenline transect;greenline to greenline width; measure entrenchment ratio; and/or Photo point
Gallagher #20114 (M)	Bill Hill #14 – 1.5 mi. FAR Gallagher #25-0.7 mi FAR-UP	Improve width/depth ratio; replace culvert to re-connect lower reach. Improve water holding capacity of adjacent wet meadow habitat (the south fork of Reach 14, previously mapped as 78).	Continue Greenline transect, add photo points in lower portion. *LPI transect(s) and /or production clippings in wet meadow habitat.
Gallagher Mountain AMP #30013 (I)	Gallagher #23–1.9 mi. FAR-UP Lovells Gulch #80-0.7 mi. FAR	Increase deep-rooted riparian species, stabilize channel Reduce streambank impacts, improve width/depth ratio, mitigate entrenchment and active headcutting.	Greenline transect including greenline to greenline width and/or photo points. Greenline to greenline width and/or photo points
Lima Peaks #30470 (M)	Little Sheep EF #913-0.3 NF	Re-connect natural channel	Photo points

Allotment Name and #	Stream or Wetland and Number	Objective	Monitoring Methodology
Snowline AMP #30029 (I)	Junction trib. #945- 0.2 mi. FAR Lower Junction trib. #993-0.4 mi. FAR	Reduce streambank impacts, improve width/depth ratio, increase deep-rooted riparian species	MIM and/or photo points.
	Junction trib. #904-37 acres FAR-DN Snowline Spring #1 - NF	Clean up old materials, reduce livestock impacts to wetland, mitigate active headcutting, increase water holding capacity of wetland and increase deep rooted riparian vegetation (willows, sedges).	Wetland delineation, LPI transect perpendicular across the reach in several locations and/or photo points.
	Junction trib. #909-8.9 acres FAR-UP	Reduce hummocks	Photopoint(s)
	Dutch Hollow #906- 0.6 mi. FAR-UP	Improve aspen recruitment.	photopoint(s) in riparian associated with woodland treatments (if completed).
Snowline AMP Custodial #20607 (C)	Junction #941-0.9 mi. FAR	Reduce streambank impacts, improve width/depth ratio, increase deep-rooted riparian species	Greenline transect,greenline to greenline width and/or photo points.
	*Big Beaver EF #946- 0.5 mi. FAR-DN	Mitigate entrenchment and active head cutting.	Longitudinal profile, entrenchment ratio at multiple cross-sections, and/or photo points

*Monitoring contingent on restoration or enhancement project being implemented.

Key Issue #2: Upland and Sagebrush Steppe Habitat

Objectives:

- Maintain high quality sagebrush and grassland habitat where it is present
- Improve the soil/site stability, hydrologic function, and biotic integrity of upland sites in allotments where one or more of these attributes of rangeland health was determined to be reduced.
- Increase cover and frequency, and diversity of native perennial cool season herbaceous species (especially bluebunch wheatgrass, and Idaho fescue which are priority upland

plants) where concerns were documented, which will improve the soil and site stability, hydrologic function, and site productivity.

- Reduce phase 1 or phase 2 conifer encroachment within GRSG seasonal habitats through prioritization of vegetation treatments closest to occupied leks, while maintaining 15% sagebrush canopy cover on no less than 70% of existing sagebrush habitat throughout the watershed.

Return fire to the landscape as a natural disturbance agent for the purpose of resiliency and diversity of seral classes (age, structure), through the use of prescribed fire.

Monitoring activities to measure progress towards meeting upland habitat and associated species objectives:

- Continue monitoring existing upland studies to measure progress towards objectives.
- Non-commercial mechanical/prescribed fire treatments:
    - Gather fuels and vegetation transect data on up to five representative sites. Photographic documentation should include pre and post-treatment photos from a designated point to verify ocular estimates. If prescribed burns are conducted after May 15, complete migratory bird surveys prior to burning activities.
    - Set up AIM monitoring in at least one high priority prescribed fire unit.
    - Monitor area for noxious weeds and cheatgrass prior to prescribed burns, treat any occurrence of noxious and invasive weeds before prescribed burn occurs; recheck and re-treat as necessary: within one month as well as during the fall following the prescribed burn and annually for as long as necessary to prevent seed production and mitigate noxious and invasive species expansion.
    - Directly after prescribed fire treatments, retake photographs at established points and/or retake measurements along each pre-treatment transect to determine if treatment objectives have been attained.
    - One to four years after treatment: Re-measure transects and photo points to show vegetative response to the treatment and progress towards meeting objectives.

Table 2: Site Specific Upland and Sagebrush Steppe Habitat Monitoring

Allotment Name	Objective	Monitoring Methodologies
All allotments	Maintain or increase composition and cover of cool season perennial bunchgrasses	Daubenmire or Quadrat Frequency transects and/or Photo points (most of this monitoring is already in place, but will be continued) In Snowline AMP, install new Daubenmire transects in Fields 6 and 9.
Clark Canyon AMP; Bell Canyon, Roe West	Reduce phase 1 or phase 2 conifer encroachment within GRSG seasonal habitats through prioritization of vegetation treatments closest to occupied leks, while maintaining 15% sagebrush canopy cover on no less than 70% of existing sagebrush habitat throughout the watershed	-Habitat Assessment Framework (HAF) - Line Point Intercept plots to measure canopy cover of sagebrush, and herbaceous and forb understory; AIM and/or photo points.
Williams, Roe West, Bell Canyon	Improve functional structural groups (ie. Increase mid-height bunchgrass composition) through inter-seeding on primary range	Within treatment units establish baseline Line Point intercept transects and monitor post treatment shifts in plant composition and bare ground.

Key Issue #3: Forest and Woodland Habitat

Objectives:

- Maintain/enhance existing aspen and promote successful regeneration of aspen.
- Where terrain and access allow, salvage dead and dying forest stands affected by insect activity, and promote future stand resiliency to insect epidemics. Utilize the resulting forest products where feasible.
- Mitigate mortality of whitebark and limber pine from insects and diseases in priority areas, consider planting and promote successful regeneration.
- Where possible, promote stand diversity by creating a mosaic of varied seral stages and stand structures using commercial and/or non-commercial timber harvest techniques.
- Consider planting mountain mahogany, removing competing juniper and Douglas fir expansion, and creating browse barriers to retain and enhance mountain mahogany habitat.

Monitoring activities to measure progress towards meeting forest and woodland habitat objectives:

<u>Pre- Implementation:</u>

- Commercial Harvest Units:
  - Complete monitoring pretreatment to classify the existing vegetation type within a representative sample of each stand type. Walkthrough survey data

includes canopy species composition and density, understory vegetation, fuel loading, and density and size class of snags and down wood.
    - Establish GPS photo points within a representative sample of stand types, and document general stand conditions with photos. Documentation will reflect the particular objectives of individual units.
    - Establish GPS photo point(s) showing approximate percent cover of habitat type species and any occurrence of insect/disease at the landscape-scale.
- Whitebark and Limber Pine Treatments:
    - For trees suspected of being blister rust resistant, GPS and tag tree. Measure DBH, height, and crown ratio.
    - Establish GPS photo points within a representative sample of stand types, and document general stand conditions with photos. Documentation will reflect the particular objectives of individual units.
    - Establish GPS photo point(s) showing approximate percent cover of habitat type species and any occurrence of insect/disease at the landscape-scale.

Post Implementation:

- Commercial Harvest Units:
    - Within two years after implementation on a given unit, re-visit each stand to obtain the same data measurements described above and evaluate if the stand objectives were reached.
    - Monitor post-harvest stands for new insect and disease activity.
    - Ungulate browse monitoring of aspen regeneration may be implemented if excessive browsing appears to be restricting new aspen suckers from growing taller than browse height.
- Whitebark and Limber Pine Treatments:
    - Complete re-application of pheromones. Inspect trees for evidence of mountain pine beetle attack and/or blister rust.
    - Complete stocking surveys in areas planted with whitebark pine.
    - Within two years after implementation on a given unit, re-visit each stand to obtain the same data measurements described above and evaluate if the stand objectives were reached.
    - Monitor for new insect and disease activity.

Monitoring of prescribed fire treatments to reduce slash post-harvest, and following whitebark pine day-lighting treatments are the same as described for prescribed fire monitoring activities listed under Key Issue #2: Upland Health and Sagebrush Steppe Habitat.

Mountain Mahogany

- Stake row survival surveys will be used to determine mountain mahogany planting efficacy. Data will be used to determine if plantings prove to be effective, and the necessary site/site preparation (browse barriers) needed to ensure success. Browse levels and effectiveness of browse protection measures will be monitored at the same time.

Resource Concern #1: Special Status Species and Big Game Habitat

Objectives:

- Within Sage Grouse Priority Habitat Management Areas (PHMA), the desired condition is to maintain no less than 70% of all lands ecologically capable of producing sagebrush

with a minimum of 15% sagebrush canopy cover or as consistent with specific ecological site conditions.

- Cooperate with MT Fish, Wildlife and Parks to expand the current distribution of westslope cutthroat trout (WCT)
- Maintain or enhance habitat for sensitive plant species and provide ample opportunity for reproduction and seedling establishment.
- Enhance/improve/protect "Priority Habitats" including aspen, mountain mahogany, whitebark pine and limber pine.

Monitoring Activities to measure progress towards meeting Fish, Wildlife and Special Status Species Habitat objectives:

Table 3: Site Specific Monitoring for Sagebrush Obligate Species Habitat

Allotment Name	Objective	Monitoring Methodologies
All Priority Greater Sage Grouse Habitat	-Within Sage Grouse Priority Habitat Management Areas (PHMA), the desired condition is to maintain no less than 70% of all lands ecologically capable of producing sagebrush with a minimum of 15% sagebrush canopy cover or as consistent with specific ecological site conditions.	-Habitat Assessment Framework (HAF) - Line Point Intercept plots to measure canopy cover of sagebrush, and herbaceous and forb understory.
	-Maintain or increase composition of GRSG preferred forbs (e.g. composites and legumes) in sage grouse nesting/early brood rearing habitat.	-HAF
	-Maintain an average 7 inches herbaceous understory within site potential within sage grouse nesting/early brood rearing habitat.	-Forage utilization; HAF and AIM

Related objectives and monitoring activities to measure progress towards fish, wildlife and special status species habitat are included above under Key Issues for Riparian, Wetland, and Aquatic Health, Upland Health and Sagebrush Steppe Habitat, and Forest and Woodland Habitat.

Additional monitoring activities specific to fish, wildlife and special status species habitat include:

- Document and establish baseline inventory for any new "unmapped" populations of sensitive plants that are found. The inventory should include the number of individual plants, a description of the habitat (e.g., associated species, soils, aspect and elevation) and an assessment of any existing and potential threats to the population.
- Maintain or increase density, frequency and cover of bitterroot milkvetch in Cedar Creek and Shoshone Cove allotments.
- Coordinate with MTFWP and USFS biologists to continue delineating seasonal habitat for sage grouse.
- Coordinate with MTFWP to continue annual sage grouse lek monitoring (male lek attendance counts).

Resource Concern #2: Socioeconomics

Objectives:

- Continue to contribute to the local economy by providing an opportunity for sustainable uses on public land including livestock grazing, forest and woodland products and recreational activities.
- Recover economic value of dead/dying timber before it is lost due to decay, where feasible.

Trends in socioeconomics will not be monitored by the local BLM office.

Resource Concern #3: Noxious and Invasive Species

Objectives:

- Reduce or eliminate noxious and invasive vegetative species within the watershed.
- Mitigate the spread of noxious and invasive plants into, within, or from the watershed.
- Prevent or minimize the spread of cheatgrass.

Monitoring activities to measure progress towards meeting noxious and invasive species objectives are included in above under Riparian, Wetland, and Aquatic Habitat and Upland and Sagebrush Steppe Habitat.

Any projects causing any soil disturbance will be seeded with a native seed mix and monitored for noxious and invasive species until the disturbed area is re-vegetated and infestation by noxious or invasive species is no longer a concern due to the disturbance.

Resource Concern #4: Recreation and Travel Management

Objectives:

- Effectively implement the Dillon RMP Travel Management Plan.
- Revise motorized route designations as necessary to correct mapping errors and improve route designations.
- Reduce unauthorized (non-designated route travel) motor vehicle use.
- Maintain motorized wheeled vehicle access to those areas where it already exists, and improve access to public land where appropriate and where opportunities are currently limited.

Monitoring will consist of compliance checks throughout the year to determine if closed roads show signs of use, as well as the enforcement of the travel management plan, specifically during the big game hunting season.

Resource Concern #5: Visual Resources Management

Objectives:

- Limit management activities or projects within the Bell-Limekiln Canyon Wilderness Study Area to avoid "attracting attention" in accordance with VRM Class I objectives.
- Manage the 2,922 acres, located east of the Blacktail Mountains WSA, as described in the VRM Class II guidelines; to retain the existing character of the landscape.
- Manage the remainder of the watershed according to objectives stipulated under VRM Class III guidelines.

Monitoring activities to measure progress towards meeting visual resource objectives include: Reviewing proposed activities for consistency, and encouraging field staff to look around when they are in the area and report unauthorized activities that may be impacting visual resources.

Resource Concern #6: Wilderness

Objectives:

- Maintain wilderness characteristics of the Bell-Limekiln Canyon WSA.
- Manage the Bell-Limekiln Canyon WSA to the non-impairment standard as outlined in BLM Manual 6330 - Management of Wilderness Study Areas, until congress either releases it from further consideration or designates it as wilderness.
- Maintain, on a continuing basis, an inventory of wilderness characteristics as describe in BLM Instruction Memorandum No. 2011-154.

Planned monitoring will consist of compliance checks and continuation of existing monitoring. WSA monitoring forms will be completed, and photographic documentation will be used where applicable.

Resource Concern #7: Cultural and Paleontological Resources

Objectives:

- Preserve and protect significant cultural and paleontological resources and ensure that they are available for appropriate uses by present and future generations.
- Reduce imminent threats from natural or human-caused deterioration, or potential conflict with other resource uses.
- Ensure that all authorizations for land and resource use avoid inadvertent damage to federal and non-federal cultural and paleontological resources in compliance with Section 106 of the National Historic Preservation Act and Paleontological Resources Protection Act. Consult with Native Americans to identify cultural values or religious beliefs that may be affected by BLM authorizations or actions.

Annual monitoring of cultural resources that are eligible to the National Register of Historic Places (NRHP) and/or that have been identified as places of tribal traditional, cultural, and religious value will be completed in order to measure the change in the state and characteristics of these resources. These resources include 24BE1005 (pictograph), 24BE1319 (pre-contact and protohistoric camp) and 24BE2102 (historic cabin) in the Gallagher Allotment, 24BE1159 in the Little Sheep Allotment, 24BE660 (pre-contact stone features), 24BE1161 (pre-contact stone features and artifacts), 24BE1165 (pre-contact stone features and artifacts) in the Snowline Allotment, and 24BE2099 (Henneberry Homestead) in the Ney Ranch un-alloted parcel. In addition, the Henneberry House and small cabin (24BE2099) will be preserved, rehabilitated, and/or restored in accordance with the Secretary of Interior's Standards for the Treatment of Historic Properties. In addition, cultural resources that are unevaluated or new cultural resources that are determined eligible to the NRHP will be annually monitored on a prioritized basis and within staff constraints.

Monitoring will include photographs, updating the site form and site map to current professional standards, if necessary, and the completion of a site monitoring form that measures the condition of the site. Monitoring forms will include information about land use on and around the site, vegetation cover and type(s), soils and slopes, extent of erosion/damage, and visitor pressure.

For built structures, an assessment of the exterior and interior cladding will be done. Monitoring the condition of cultural resources is necessary for appropriate long-term management.

Types of Data Collected

The established permanent vegetative and physical trend transects in the Red Rock/Lima Watershed were read and data was updated during 2016. The date when these studies were initially established and read is considered baseline data. However, in order to adequately measure progress towards site specific objectives, additional studies outlined in this plan will be established in key areas during 2018 or 2019 and baseline data will be gathered on the newly established studies. Baseline data is considered the starting point from which to measure progress towards meeting objectives or effectiveness of management changes implemented beginning in 2019 (on the new studies only). Data from existing studies will be compared and evaluated from the time they were established and data was initially collected.

Key areas are defined as relatively small areas that reflect or have the capability to reflect the effectiveness of management of the resources of a larger area. Depending on management objectives, a key area may be a representative sample of a large stratum, pasture, allotment, or a particular management area. Key areas or monitoring sites should represent the high variability of riparian, upland and forest or woodland habitat types, patterns of use, and conditions of forest, rangeland or riparian health. Over the next several years the following data will be collected (See Table 4).

- Actual livestock and wildlife use. Actual use is the grazing use of an area by all classes of forage consumers. This information is necessary to provide a correlation between utilization and trend data. Considered alone, actual use data are essentially meaningless. However, when considered in conjunction with climate and utilization data, this data is necessary to interpret trend data accurately.
- Annual compliance, including utilization of upland forage, browse levels on willows and aspen, measurement of sedge stubble heights and/or measurement of stream bank alteration. This monitoring will occur primarily at established key areas, but may occur in other areas as well. Annual compliance monitoring will be done on a prioritized basis with I category allotments being the highest priority, followed by M, and then C category allotments. In areas where competition for resources may occur between livestock and big game, pre-livestock data may also be collected. This annual data will be used to help determine pasture moves, accurately interpret trend data, and serve as an early indicator on whether implemented changes are effective. If annual monitoring reveals resource degradation or ineffective management changes (as determined by BLM specialists), trend studies may be read at any time prior to the next scheduled assessment (2026), and adjustments in management analyzed in the interim.
- Local precipitation and temperature. This data is necessary to interpret trend data accurately.
- Long term trend. Trend data will be used to measure progress towards meeting objectives as described above.
- Land Use Plan effectiveness monitoring. AIM data will continue to be collected and used to measure land use plan effectiveness, landscape scale effectiveness (e.g. Red Rock/Lima Watershed), and may be used at the project level (e.g. prescribed burns) as they are implemented. This data will be stored in the TerraDat database, which will be available to the public.

Trend refers to the direction of change and indicates whether the forest, rangeland, riparian area or other resource is being maintained or is moving toward or away from the desired plant community or other specific management objectives. Trend studies are important in the long term for determining the effectiveness of management actions in meeting or moving towards management objectives.

Trend data will be collected again in 2026, unless specified otherwise for specific objectives. The Red Rock/Lima Watershed will be re-assessed or evaluated during 2027. In this process, all monitoring data will be summarized, analyzed, interpreted, and evaluated to measure progress toward meeting objectives. Trend data gathered in 2026 will be compared to baseline (established in 2018 or 2019) and existing trend data gathered or updated in 2016. The measured change in the data will be used to measure progress toward meeting objectives, thereby evaluating management and making informed decisions regarding subsequent management (continuation or change). This is called adaptive management. For example, if monitoring data shows that progress is being made toward established objectives, current management will be continued or modified slightly as warranted, according to the data. However, if data shows a downward trend (change away from objectives) or does not show any progress toward meeting objectives by 2026, and it is determined that current livestock management is a significant factor in precluding progress toward meeting objectives, then management will be adjusted by implementing an alternate system, changing the season of use and/or reducing authorized AUMs. The level of adjustment will be determined by the degree of divergence from the objectives. Failure to meet objectives from other discernable causes (unauthorized OHV use, roads, etc.) will be handled in a similar manner as described for livestock grazing.

Monitoring methodology descriptions are available for review at the Dillon Field Office. Technical references and BLM procedural handbooks are also available on BLM library website.

Table 4: Planned Resource Monitoring Activities

Type	Method	Responsibility	Frequency
Actual Use	Actual Use Reports submitted by grazing lessees Wildlife observations Wildlife population monitoring in cooperation with the MFWP Recreation user days	Range, Wildlife and Recreation Staff	Annually
Compliance/ Utilization	Utilization – Grazed/Ungrazed Method or Key Forage Plant Method	Range, Wildlife or Fisheries Biologists, Hydrologist Outdoor Rec Planner.	Annually on a prioritized basis
	Stubble height – Stubble Height Method		
	Bank alteration – Stream bank Alteration Methodology as defined by Idaho State Office BLM, 2000		
	Browse use – Extensive Browse Method		

Type	Method	Responsibility	Frequency
Climate	Precipitation data available from National Oceanic and Atmospheric Administration and other sources	Available from external sources	Annually
Habitat Characterization	Inventory for leks and seasonal habitats. Habitat Assessment Framework (HAF) in priority and general habitat, elk calving and winter and mule deer winter habitats.	Wildlife Staff, MFWP	Annually on a prioritized basis
Population(s)	Sage Grouse – male lek attendance WCT – periodic population sampling through electro-fishing Pygmy rabbit surveys Wildlife population monitoring (MFWP has lead)	MFWP and BLM Biologists will coordinate and assist, where applicable	Annually for sage grouse; 5 year intervals for WCT
Trend (also see Table 3)	**Biotic** Assessment, Inventory and Monitoring (***AIM***) Quadrat Frequency Daubenmire Line Point Intercept Cover Board Woody Species Regeneration Greenline Multiple Indicator Monitoring (MIM) Macroplots/Belt Transects Photopoints Fire Regime Condition Class (FRCC) LANDFIRE (or similar program replacing LANDFIRE) Stream temperature monitoring Stream flow measurement	Range, Wildlife or Fisheries Biologists, Hydrologists, Foresters, Fuels Specialists	Any new trend monitoring studies will be established during 2018 or 2019. Trend data (new and existing studies) will be gathered again in **2026.**
	Physical Cumulative width/depth ratio, MIM, site specific soils interpretation.		
Watershed Assessment	Analysis, Interpretation, Evaluation, Recommendations followed by NEPA	ID team	FY2027

Budget Requirements

This monitoring plan was prepared with the assumption that funding will remain at or near existing levels for the foreseeable future. In this light, it is anticipated that the bulk of the monitoring workload will have to be borne by the existing range, wildlife, fisheries, forestry, fuels, hydrology, recreation, wilderness and cultural resource specialists along with a minimum of six seasonal technicians each field season for the duration of this plan. The goal is to complete all planned monitoring as scheduled. However if, due to staffing or budget constraints,

all monitoring cannot be completed, monitoring will be completed on a prioritized basis to the extent possible.

Workload associated with protests, appeals and litigation associated with Watershed Environmental Assessment Final Decisions also directly effects how much monitoring the existing staff is able to complete.

BLM DILLON FIELD OFFICE

Biological Evaluation for Special Status Fish and Wildlife Species

Form Revised August 2014 - Updated May 2017

Project: Red Rock Lima Watershed Environmental Assessment [DOI-BLM-MT-B050-2018-0009-EA]

Step 1a.	Step 1b.	Step 1c.	Step 2	Step 3.	Step 4.	Step 5.	Step 5.	Step 5.	Step 5.
List of all Special Status Species that are known or suspected to occur on the DFO.	**Current Management Status of the Species.**	**Does the species occur on this portion of the Field Office?**	**Is the species or its habitat found in the surrounding area?**	**Could this proposal have any effect?**	**Are Irreversible or Irretrievable Resources involved?**	**Alt A level of effect**	**Alt B level of effect**	**Alt C level of effect**	**Alt D level of effect**
Canada Lynx (*Lynx canadensis*)	Threatened	N	N	N	--	--	--	--	--
Grizzly Bear (*Ursus arctos horribilus*)	Threatened	N	Y	Y	N	NE	NLAA	NLAA	NE
North American Wolverine (*Gulo gulo luscus*)	Proposed Threatened	Y	Y	N	--	--	--	--	--
Mammals									
Fringed myotis (*Myotis thysanodes)*	Sensitive	N	Y	N	--	--	--	--	
Gray Wolf (*Canis lupus*)	Sensitive	Y	Y	Y	N	MIIH	MIIH	MIIH	BI
Pygmy Rabbit (*Brachylagus idahoensis*)	Sensitive	Y	Y	Y	N	MIIH	MIIH	MIIH	MIIH
Spotted Bat (*Euderma maculatum)*	Sensitive	N	Y	N	--	--	--	--	--
Townsend's Big-eared Bat *(Plecotus townsedii)*	Sensitive	N	Y	N	--	--	--	--	--
Birds									
American Bittern (*Botaurus lentiginosus*)	Sensitive	Y	Y	N	--	--	--	--	--
Bald Eagle (*Haliaeetus leucocephalus*)	Sensitive	Y	Y	N	--	--	--	--	--
Black Tern *(Chlidonias niger*)	Sensitive	Y	Y	N	--	--	--	--	--

(cont.) List of all Special Status Species that are known or suspected to occur on the DFO.	**Current Management Status of the Species.**	**Does the species occur on this portion of the Field Office?**	**Is the species or its habitat found in the surrounding area?**	**Could this proposal have any effect?**	**Are Irreversible or Irretrievable Resources involved?**	**Alt A level of effect**	**Alt B level of effect**	**Alt C level of effect**	**Alt D level of effect**
Brewer's sparrow *(Spizella breweri)*	Sensitive	Y	Y	Y	N	MIIH	MIIH	MIIH	BI
Burrowing Owl (*Athene cunicularia*)	Sensitive	N	Y	N	--	--	--	--	--
Caspian Tern (*Hydroprogne caspia*)	Sensitive	Y	Y	N	--	--	--	--	--
Chestnut-collared Longspur (*Calcarius ornatus*)	Sensitive	N/A	Y	N/A	--	--	--	--	--
Common Tern (*Sterna hirundo*)	Sensitive	Y	Y	N	--	--	--	--	--
Ferruginous Hawk (*Buteo regalis*)	Sensitive	Y	Y	Y	N	NI	MIIH	MIIH	NI
Flammulated Owl (*Otus flammeolus*)	Sensitive	N	Y	Y	N	NI	MIIH	MIIH	NI
Forster's Tern (*Sterna forsteri*)	Sensitive	Y	Y	N	--	--	--	--	--
Franklin's Gull *(Larus pipixcan)*	Sensitive	Y	Y	N	--	--	--	--	--
Golden Eagle *(Aquila chrysaetos)*	Sensitive	Y	Y	N	--	--	--	--	--
Great Gray Owl (*Strix nebulosa*)	Senstive	Y	Y	Y	N	NI	MIIH	MIIH	NI
Greater Sage Grouse (*Centrocercus urophasianus*)	Sensitive	Y	Y	Y	N	MIIH	MIIH	MIIH	MIIH
Lewis's Woodpecker (*Melanerpes lewis*)	Sensitive	Y	Y	Y	N	NI	MIIH	NI	NI
Loggerhead Shrike (*Lanius ludovicianus*)	Sensitive	Y	Y	Y	N	MIIH	MIIH	MIIH	BI
Long-billed Curlew (*Numenius americanus)*	Sensitive	Y	Y	Y	N	MIIH	MIIH	MIIH	MIIH
McCown's longspur *(Calcarius mccownii)*	Sensitive	Y	Y	Y	N	MIIH	MIIH	MIIH	MIIH
Mountain Plover (*Charadrius montanus*)	Sensitive	N/A	Y	N/A	--	--	--	--	--

(cont.) List of all Special Status Species that are known or suspected to occur on the DFO.	**Current Management Status of the Species.**	**Does the species occur on this portion of the Field Office?**	**Is the species or its habitat found in the surrounding area?**	**Could this proposal have any effect?**	**Are Irreversible or Irretrievable Resources involved?**	**Alt A level of effect**	**Alt B level of effect**	**Alt C level of effect**	**Alt D level of effect**
Peregrine Falcon (*Falco peregrinus anatum*)	Sensitive	Y	Y	N	--	--	--	--	--
Sagebrush Sparrow (*Artemisiospiza nevadensis*)	Sensitive	Y	Y	Y	N	MIIH	MIIH	MIIH	BI
Sage thrasher *(Oreoscoptes montanus)*	Sensitive	Y	Y	Y	N	MIIH	MIIH	MIIH	BI
Sprague's Pipit (*Anthus spraugueii*)	Sensitive	N/A	Y	N/A	--	--	--	--	--
Trumpeter Swan (*Cygnus buccinator*)	Sensitive	Y	Y	N	--	--	--	--	--
Veery (*Catharus fuscescens*)	Sensitive	Y	Y	Y	N	MIIH	MIIH	MIIH	BI
White-faced Ibis (*Plegadis chihi*)	Sensitive	N/A	Y	N/A	--	--	--	--	--
Amphibian/reptiles									
Boreal/Western toad *(Bufo boreas)*	Sensitive	Y	Y	Y	N	MIIH	MIIH	MIIH	BI
Northern leopard frog *(Rana pipiens)*	Sensitive	N/A	N	N/A	--	--	--	--	--
Fish									
Westslope cutthroat trout *(Onchorhynchus clarkii lewisi)*	Sensitive	N	N	N				-	--
Fluvial Arctic Grayling (*Thymallus arcticus montanus*)	Sensitive	N	N	N	--	--	--	--	--
Invertebrates									
Western Pearlshell *(Margaritifera falcatea)*	Sensitive	N	N	N	--	--	--	--	--

Step 6. Are there any specific recommendations to avoid significant effects (if any)? These are mitigation measures needed to avoid determinations of: LAA, LJ, WIFV. If so, the narrative describing these recommendations would be discussed in the NEPA document.

Step 7. Documentation: This short form is intended to follow a seven-step process to provide basic biological evaluations. Judgments must not be arbitrary but should be reasoned. This form provides a "road map" of that reasoning and assumes the judgments are drawn from numerous sources. Any species-specific impacts should be discussed in the NEPA document or below under the Narrative of Potential Impacts.

The signature below certifies that:

1. The wildlife biologist has reviewed the proposed action and its alternatives, but may or may not have provided input to alternative design, depending on the issues.
2. The wildlife biologist has an understanding of the specific conditions found in the affected area. Column 1a lists all possible Special Status Species in the Dillon Field Office. Column 1b identifies the species' current management status. Column 1c indicates whether the species occurs on this portion of the Field Office, Yes (Y) or No (N), or if there are no records (N/A). Step 2 is satisfied by field visits or knowledge of local conditions from previous visits resulting in enough information to determine if the area is potential habitat for species listed in Step 1. Extensive surveys are not necessary if the conservative approach is taken that: "suitable habitat" means the potential for occupancy.
3. The wildlife biologist has an understanding of the species habitat needs and other attributes important to the determination. This can be a combination of literature review, professional experience, and consultation with others.
4. The wildlife biologist has assimilated the above information in making the "determinations" (i.e. final judgments about the scientific significance of the effects).

Signed: /s/Katie Benzel **Date:** 4/30/2018 **Signed:** /s/Paul Hutchinson **Date:** 4/20/2018

Printed Name and Title: Katie Benzel, Wildlife Biologist Paul Hutchinson, Fisheries Biologist

N/A – "Not Applicable." Indicates this species does not occur in the project area or that the project would have no bearing on its potential habitat. These species were removed from detailed analysis after field review of existing and potential habitats and consideration of distribution records.

FEDERALLY LISTED SPECIES

NE - No Effect

***LAA** - May Effect - Likely to Adversely Affect (formal consultation required)

NLAA - May Effect, Not Likely to Adversely Affect (informal consultation - concurrence with determination - required)

BE - Beneficial Effect (informal consultation - concurrence with determination - required)

SPECIES PROPOSED FOR LISTING

NE - No Effect

NLJ - Not likely to Jeopardize the continued existence of the species or result in the destruction or adverse modification of proposed critical habitat

***LJ** - Likely to Jeopardize the continued existence of the species or result in the destruction or adverse modification of proposed critical habitat

SENSITIVE SPECIES

NI - No Impact

MIIH - May Impact Individuals or Habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

***WIFV** - Will Impact Individuals or habitat with a consequence that the action may contribute to the need for federal listing or cause a loss of viability to the population or species.

BI - Beneficial Impact

*triggers formal consultation process

NARRATIVE of POTENTIAL IMPACTS

Federally Listed Species:

Canada Lynx:

The Dillon Field Office does not contain any lynx critical habitat and no lynx have been documented within the RRLW. Forested areas may provide temporary habitat for transient lynx dispersing from established lynx populations, but these areas likely do not contain all physical and biological features in adequate quantities and spatial arrangements to support lynx populations over time (USDI, 2014a). The forest habitat within the DFO is generally drier than the preferred moist boreal forests that include dense understories that provide foraging habitat and cover for the lynx's main prey, the snowshoe hare (USDI, 2014a). The USFWS provided evidence that the Beaverhead-Deerlodge National Forest (USFS managed lands in southwestern Montana where the DFO manages BLM administered lands) was likely not occupied by lynx at the time of listing and is not currently occupied by lynx, indicating that lynx do not occupy this area or this area is lacking in either quantity or spatial arrangement (or both) of one or more of the essential features. USFWS has determined that forests in southwestern Montana and the DFO are not essential to the conservation of lynx, and does not meet the definition of critical habitat (USDI, 2014a). Forest habitat in RRLW is not considered adequate lynx habitat. The watershed may be used as a lynx linkage zone between suitable habitats. The fuels treatments are proposed to reduce conifer expansion in sagebrush grassland habitat. Lynx prefer to move through continuous forests, and have been observed to avoid large openings until shrubs and trees provide enough cover to hide them (Ruggiero et al. 2000; USDI, 2003). Although sagebrush grassland habitat may provide connectivity, it is not typical lynx habitat and the conifers expanding into this habitat are generally not dense enough or tall enough to protrude above the snow for winter snowshoe hare habitat or to hide lynx moving through the area. Regeneration following proposed commercial timber harvest would provide cover and forage for snowshoe hares, however the small scale of these treatments are unlikely to lead to snowshoe hare and lynx colonization. Therefore, no alternatives proposed in this EA are anticipated to affect Canada lynx.

Grizzly Bear:

Effective July 31, 2017 the U.S. Fish and Wildlife Service (FWS) announced that the Greater Yellowstone Ecosystem (GYE) population of grizzly bears is a valid distinct population segment (DPS) and that this DPS has recovered and no longer meets the definition of an endangered or threatened species under the Endangered Species Act (ESA) (USDI, 2017). The FWS determined that the *GYE grizzly bear DPS has increased in size and more than tripled its occupied range since being listed as threatened under the Act in 1975 and that threats to the population are sufficiently minimized*. Montana, Idaho, Wyoming, and Federal agencies have approved post-delisting plans and regulations so that the GYE population of grizzly bears remains recovered. The Interagency Grizzly Bear Study Team (IGBST) estimates a 2016 GYE grizzly bear population size to be 695 within the demographic monitoring area (DMA) (Haroldson et al., 2017). Demographic monitoring protocols for the GYE grizzly population are focused on the DMA. Population size, distribution of females with young, and all forms of mortality are monitored and documented within the DMA (YGCC, 2017). The RRLW is outside of the DMA, but the allotments on the east side of Interstate-15 are within the distinct

population segment (DPS) area which delineates the legal boundary where grizzly bears are delisted. RRLW allotments west of I-15 are outside of the DPS and grizzly bears are still a listed species on this side.

There are no confirmed grizzly bear sightings within the RRLW, although they're likely to move into the area as the GYE population continues to expand and individuals have been confirmed in the Centennial Valley and Sage Creek drainage, bordering the RRLW. Since whitebark pine seeds are an important component of grizzly bear diets, actions for whitebark pine trees in this EA would promote habitat and this food source for grizzly bear. Actions include planting whitebark, protecting individual trees, cutting competing conifers around healthy whitebark pine trees, and contributing cones to the genetic breeding program.

Although there have not been any confirmed grizzly bear sightings or conflicts reported in RRLW, term grazing permits shall be amended to state that depredation losses from wolves and grizzly bear are possible. A stipulation would also be added to grazing permits stating that the permittee, agency personnel, and Montana FWP will jointly determine how to properly treat or dispose of livestock carcasses on BLM administered land to reduce the potential for attracting predators. Permittees must notify the BLM, MT FWP, or Wildlife Services as soon as is practical of any grizzly bear depredation on livestock or conflicts between grizzly bears and livestock, even if the conflict does not result in the loss of livestock. This notification would likely reduce the potential for livestock depredation and removal of the grizzly bear, and would inform agencies of grizzly bear presence in the watershed. Food storage recommendations would also be posted and encouraged to reduce potential conflicts between bears and public land users.

The commercial timber harvest units are proposed within the DPS boundary where grizzly bears are not an ESA listed species. Harvesting up to 1,188 acres of timber and constructing up to 7.25 miles of temporary road is proposed under Alternative B. Roads constructed would be temporary and reclaimed after harvest activity is concluded, and therefore would not lead to increased wildlife disturbance from improved motorized vehicle access in the long-term. A food storage stipulation will be included in timber harvest contracts to reduce the potential for attracting bears. Forest cover would be lost within the timber harvest units, until regeneration occurs. The opening up of the forest canopy will provide bear forage as grasses, forbs, and shrubs increase. Wildlife, including potentially bears, would be displaced from the units while timber harvest occurs. Foresters, fuels specialists, and wildlife biologists would coordinate the timing of forest and woodland treatments (seasonally and yearly), and the area treated per year to minimize conflicts with wildlife. Commercial harvest would not occur during big game wintering between December 1st and May 15th. Non-commercial mechanical/prescribed fire treatments are unlikely to impact grizzly bear other than displacement on the rare occasion a bear were to be present in the area during implementation. The design features and reclamation of the temporary roads within timber harvest units, lack of grizzly bear presence in the watershed, and the GYE grizzly bear DPS no longer a listed species, lead to the determination that alternatives B and C may effect, but are not likely to adversely affect (NLAA) grizzly bear. There is no effect (NE) to grizzly bear from alternatives A and D.

<u>North American Wolverine:</u>

In 2014 the United States Fish and Wildlife Service (USFWS) withdrew a proposal to list the North American wolverine in the contiguous United States as a threatened species under the ESA (USDI, 2014b). However, the District Court for the District of Montana vacated this withdrawal of the USFWS's proposed rule, which returned the process to the stage of the proposed listing rule

published in 2013 (USDI, 2016a), making them a Proposed Threatened species. Wolverines occur in coniferous montane forest types, preferring rugged, roadless, isolated habitats. Home range size in western Montana averages 150 mi^2 for females and 163 mi^2 for males (Foresman, 2012). Wolverines are more likely to occur at higher elevations on Forest Service land in the Tendoy Mountains and Lima Peaks, with transient individuals on BLM lands. The RRLW does not have the high elevation alpine habitat to sustain the large home range females require for natal areas. Alternatives proposed in the RRLW would not affect wolverines in this area.

BLM Sensitive Species:

Fringed Myotis, Spotted Bat, and Townsend's Big-Eared Bat:

All three BLM sensitive species of bats are found in a variety of habitat types including desert shrublands, sagebrush-grassland, and woodland habitats. These species roost in caves, mines, rock crevices, buildings, and other protected sites (Foresman, 2012; MNHP, 2018a). These species, along with twelve other species of bats found in the state of Montana, consume an enormous quantity of insects. None of these BLM sensitive species have been documented in RRLW. While their presence has not been documented, habitat does exist within the watershed. In the neighboring Big Sheep Creek watershed, an SM2 Bat+ detector/recorder was deployed for two years to document year-round bat echolocation calls (Maxell et al., 2016). Out of a total of 12,269 bat call sequences recorded, six species of bats were definitively confirmed, not including these three sensitive species. None of the alternatives proposed in the RRLW are expected to impact these three species.

Gray Wolf:

The Northern Rocky Mountain population of gray wolves, including Montana wolves, was delisted from the list of Endangered and Threatened Wildlife in 2011 as part of the Appropriations Act. To avoid relisting, Montana complies with federal regulations to manage wolves in a manner that will guarantee that the state maintains at least a minimum of 150 wolves and 15 breeding pairs (Boyd et al., 2017b). Since delisting, hunting and trapping seasons for wolves have been implemented in Montana. The combined maximum hunting and trapping bag limit is five wolves per person during the 2017-18 season. Minimum counts of wolves and breeding pairs were the metric used during wolf recovery and were more achievable when wolf populations were lower. As populations have expanded and increased in size, minimum counts have become expensive and unachievable. During 2016, FWP's minimum count goal was to verify the presence of at least 150 wolves and 15 breeding pairs as required by the state management plan. They confirmed at least 109 packs, 477 wolves, and 50 breeding pairs in Montana at the end of 2016 (Boyd et al., 2017b). Wolves are found throughout the Dillon Field Office, including the RRLW.

Gray wolves move seasonally following migrating ungulates within their territory. They are opportunistic carnivores that predominantly prey on large ungulates. Primary prey species in the RRLW include deer, elk and moose. Alternative prey sources include rodents, vegetation and carrion as well as domestic livestock such as cattle and sheep. Conflicts between wolves and livestock are a concern. BLM administered land in RRLW does not include any authorized sheep grazing. Livestock grazing permits will be amended to make permittees aware that losses to livestock could occur from gray wolves. Even with the introduction of hunting and trapping seasons in Montana since de-listing, wolf populations have flourished. While individuals may be impacted, no alternatives

proposed in this EA are anticipated to impact the gray wolf population that would lead to re-listing. Alternative D in the Snowline AMP allotment may have a beneficial impact on gray wolves with the elimination of potential conflicts between wolves and cattle with the removal of grazing from this allotment. This would only affect BLM administered land within this allotment however, and since gray wolves utilize a large landscape, beneficial impacts would be minimal, especially with the continuation of livestock grazing on surrounding private and public lands.

Pygmy Rabbit:

Pygmy rabbits are endemic to sagebrush habitat. They require sagebrush for forage and cover, as well as deep alluvial soil to dig burrows. Sagebrush comprises nearly 100% of their winter diet and over half of their summer diet. Pygmy rabbits occupy sagebrush habitat year-round on both sides of Interstate-15 in the Snowline area, along the east face of the Tendoy Mountains, and in the Henneberry Ridge area. Non-commercial mechanical/prescribed fire treatments are proposed in the Tendoy Mountains, adjacent to areas where pygmy rabbits have been documented. Treatment units will be surveyed for pygmy rabbits prior to implementation and if pygmy rabbits are documented, unit boundaries would be modified to exclude their habitat. Livestock grazing is not anticipated to impact pygmy rabbit viability. A recent study in the DFO (Camp et.al. 2014) concluded that the presence of cattle did not markedly influence properties of vegetation related to predation risk or integrity of burrow systems when grazing is permitted at sustainable levels. Under Alternative D in the Snowline AMP, Pine Butte Pasture, removing livestock grazing would increase herbaceous cover for pygmy rabbits, if they are present in this pasture. Individuals or habitat may be impacted, however none of the alternatives are anticipated to contribute to a trend towards federal listing or cause a loss of viability to the population or species.

American Bittern, Black Tern, Caspian Tern, Common Tern, Forster's Tern, and Franklin's Gulls:

American bitterns, black terns, Forster's terns, and Franklin's gulls are summer residents in freshwater wetlands with tall emergent vegetation, where they forage along shorelines (MNHP, 2018a). Caspian terns and common terns prefer to nest on islands within large lakes or reservoirs with sandy or stony beaches. These species have been documented at Clark Canyon Reservoir and foraging in agricultural fields within the RRLW. None of the proposed alternatives would likely affect the habitat that these species typically use.

Bald Eagle:

Bald eagles were down-listed from Endangered to Threatened in 1995, and delisted in 2007. The Montana Bald Eagle Management Plan and addendum (MBEWG 1994, MBEWG 2010) directs management of this species in the state. Currently, bald eagles continue to receive protection from the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act. In 1980, Montana had 31 known or suspected bald eagle territories. There were over 700 nesting pairs reported in 2014 (MBEWG, 2016). The specific population recovery objective for nesting bald eagles in Montana was 99 nesting pairs, which was reached in 1990. Nesting sites are generally located within larger forested areas near large lakes and rivers where nests are usually built in the tallest, oldest, large diameter trees. Nests are also commonly found in cottonwoods along rivers in the DFO. There are 7 active bald eagle nest territories in the RRLW, with all but two in cottonwoods along the Red Rock and Beaverhead Rivers. The majority of their diet is comprised of

fish. Important prey for bald eagles includes waterfowl, especially in the winter, salmonids, suckers, whitefish, carrion and small mammals and birds. General objectives for bald eagle habitat management in Montana include: maintaining prey bases; maintaining forest stands currently used or suitable for nesting, roosting, and foraging; planning for future potential nesting, roosting, and foraging habitat; and minimizing disturbances from human activities in nest territories (MNHP, 2018a). None of the alternatives in this EA are expected to impact habitat or prey for bald eagles to the extent that would lead to federal listing.

Black-backed Woodpecker:

Black-backed woodpeckers inhabit early successional, burned forests of mixed conifer, lodgepole pine, Douglas-fir, and spruce-fir. Black-backed woodpeckers are highly responsive to forest fire and other processes, such as spruce budworm outbreaks, resulting in high concentrations of wood-boring insects invading dead trees. The burned forest habitat is lacking in the RRLW, however wood-boring insect breakouts have occurred in the watershed, contributing potential black-backed woodpecker habitat. Prescribed fire treatments proposed in this EA, targeted to kill colonizing Douglas-fir and juniper, would increase foraging opportunities for this species. Thinning treatments proposed for the commercial timber harvest would reduce future potential insect outbreaks within these units. This would also reduce habitat for black-backed woodpeckers to forage on these insects. The units are only a small part of the extensive landscape of forested habitat affected by insect outbreaks. No alternatives are expected to impact black-backed woodpecker populations that would cause a loss of viability or contribute to federal listing.

Brewer's Sparrow, Loggerhead Shrike, Sagebrush Sparrow, and Sage Thrasher:

Site specific sagebrush losses from prescribed burns proposed under Alternatives B and C could displace loggerhead shrike, sage thrasher, sagebrush sparrow, and Brewer's sparrow but adjacent suitable habitat is available. While sagebrush cover would be lost in the treatment area in the short-term, sagebrush habitat would be restored to the area with the reduction of conifer expansion. Currently, sagebrush habitat has been reduced or eliminated due to juniper and Douglas-fir expansion, reducing/eliminating habitat for these species. The treated area would be converted to early seral sagebrush habitat and progress to mid-late seral in about 20 years. This would provide for seral and structural diversity within sagebrush steppe habitat on a landscape level. Fire managers and wildlife biologists would coordinate the timing of prescribed fire treatments (seasonally and yearly), and the area treated per year to minimize conflicts with wildlife (i.e. complete prescribed fire outside of migratory bird nesting season). This project MIIH, however in the long-term the prevention of sagebrush habitat from becoming conifer habitat would benefit these species, and actions in Alternatives B and C would not cause a loss of viability for the populations or species, or contribute to federal listing. Under Alternative A, sagebrush habitat would be lost in the long-term as it continues to convert to forested habitat. Under Alternative D in the Snowline AMP, Pine Butte Pasture, removing grazing would increase herbaceous cover for these species.

Burrowing Owl:

Burrowing owls are found in open grasslands characterized by sparse vegetation and bare ground where abandoned burrows dug by mammals such as ground squirrels, prairie dogs and badgers are available. They are not known to excavate their own burrows, but

existing burrows may be enlarged or modified making them more suitable. There are no prairie dog colonies in the DFO, but badger, ground squirrel and pygmy rabbit burrows are prevalent. Although they provide burrows, badgers are a major predator of burrowing owls. Burrowing owls in this area are thought to be migrants. Burrowing owls in the northern part of its range migrate to Mexico and Central America. They are opportunistic feeders with a varied diet dependent upon the time of year with invertebrates comprising the majority of their diet in most areas, but small mammals, amphibians, reptiles, and birds may also be consumed. The alternatives in this EA are not expected to have any effect on burrowing mammals that provide nesting habitat for burrowing owls and grassland habitat is not expected to change. None of the alternatives in this EA would impact burrowing owls or lead to Federal listing.

Ferruginous Hawk:

Ferruginous hawks that breed in Montana are migratory. Fall migration begins in August through early September. Young birds will migrate south earlier than, and independent of, adults. Restani (1991) reported most ferruginous hawks return to the Centennial Valley, which neighbors RRLW, in April and May. Ferruginous hawks construct nests on the ground on hill slopes or crests, on rocky outcrops and cliffs, and in trees and shrubs (usually mountain mahogany and juniper in the DFO). Nests are largely made with sagebrush stems and lined with cow dung, sod, and bark that the female strips from trees. According to the North American Breeding Bird Survey, ferruginous hawk numbers were stable or slightly increasing from 1966 through 2015 (Cornell Lab of Ornithology, 2018). Possible threats to ferruginous hawks include reduction in prey, competition from other hawks (mainly Swainson's and red-tailed hawks), loss of prairie habitat, nest site disturbance, or impacts in wintering areas. In southwestern Montana, primary prey includes ground squirrels, passerines, grasshoppers, and voles (Restani 1991). Vulnerability of prey is an important factor in ferruginous hawk habitat suitability. Ferruginous hawks avoid dense vegetation that reduces their ability to see prey (MNHP, 2018a). The area from McKenzie Canyon to Clark Canyon Reservoir and northeast of I-15 between Lima and Monida lie within the Lima/Sweetwater Breaks key raptor management area. This area was designated through Fish and Wildlife 2000 and the 2006 Dillon RMP as amended because of the concentrated nesting density of ferruginous hawks, prairie falcon, golden eagles and other raptors in the 1980s to mid-1990s. Since that time, there has been a decline in ferruginous hawk breeding territories, while no apparent changes to habitat have occurred (USDI, 2005). These changes may be related to declines in prey availability or impacts on wintering/migration habitats. Management objectives for the key raptor management area include maintaining sagebrush steppe and mountain mahogany habitat, and controlling disturbance of nest sites. Proposed conifer removal within mountain mahogany habitat and non-commercial mechanical/prescribed fire treatments within or near the raptor management area of the Tendoy Mountains, would be surveyed for nesting ferruginous hawks and timing stipulations would be applied if they are present, to avoid disturbing them. These proposed projects would retain sagebrush steppe and mountain mahogany habitat for ferruginous hawks. Individuals or habitat may be impacted by the non-commercial mechanical/prescribed fire treatments proposed under Alternatives B and C, however loss of population or species viability would not occur, and long-term habitat retention would benefit ferruginous hawks.

Flammulated Owl:

In the northern part of their range flammulated owls are a Neotropical migrant arriving in late April-early May and departing by October. Flammulated owls are obligate cavity nesters and prefer mature open canopy ponderosa pine and Douglas-fir forests but have also been documented using cavities in pure aspen stands. No food habit data exists for flammulated owls in Montana, however

information gathered from other areas of the species' range indicate flammulated owls mainly hunt at night foraging on nocturnal arthropod prey along the interface between forest or woodland and grassland. Most studies have shown that flammulated owls have a preference of ponderosa pine and they have not been documented in the RRLW. Improvements to riparian habitat and associated aspen stands would improve potential foraging habitat, while aspen cavities would provide potential nesting habitat. The non-commercial mechanical/prescribed fire treatments proposed under Alternatives B and C in this EA would not likely impact the mature trees that flammulated owls prefer for nesting. Potential flammulated owl habitat would be removed for the commercial timber harvests. Flammulated owls are not known to occur in the treatment areas and the size of the treatment units is minimal on the landscape scale. The retention of snags (see Chapter 2, Alternative B, Commercial Harvest*)* within the harvest units maintains flammulated owl nesting habitat and the increase in shrubs with the opening of the forest canopy would provide foraging habitat. If nests are located, a timing stipulation would be implemented for activity to occur outside of nesting season and a no-cut buffer would be applied, if applicable. Commercial timber harvest MIIH, however actions proposed under alternatives B and C are not expected to contribute to a trend towards federal listing or cause a loss of viability to the population or species, especially considering that this species has not been documented in this area. Alternatives A and D would not likely impact flammulated owls.

Golden Eagle:

Golden eagles are protected under the Bald and Golden Eagle Protection Act of 1940 and the Migratory Bird Treaty Act. Some golden eagles remain in Montana year-round, but vertical migration from mountains to valleys occurs in the winter. They generally nest on cliffs when available, or in large trees associated with sagebrush/grassland. This open shrub/grassland is used for hunting jackrabbits, ground squirrels, and carrion. They occasionally prey on deer and pronghorn (mostly fawns), waterfowl, grouse, weasels, skunks, and other animals. Management of healthy golden eagle populations requires maintaining prey habitat where eagles forage. This involves sustaining native grasslands and shrub-steppe landscapes which are the prime habitats for jack rabbits. Shooting and poisoning from the ingestion of lead fragments in carrion that have been shot with lead bullets are a primary threat to golden eagles. None of the alternatives in this EA are expected to impact golden eagle nesting habitat or prey abundance.

Great Gray Owl:

Great gray owls are a resident species in Montana, both during the breeding season and in winter. During periods of low prey abundance and/or large snowfalls birds may move from higher to lower altitudes within the state. Also, birds from Canada may move into the state during winter for similar reasons (MNHP, 2018a). They inhabit a wide range of habitats and elevations, preferring mature coniferous and deciduous forests near meadows. Great gray owls do not build their own nests. Nest sites include large, broken-top trees, debris platforms from dwarf mistletoe, and stick nests from other raptors. Great gray owls prefer natural forest openings such as meadows, bogs, and fens for foraging as well as subclimax, old-growth, selectively logged, and small clear-cut forests. They usually forage in open areas where scattered trees or forest margins provide suitable sites for visual searching and perching. Their main prey is small mammals, especially rodents, such as voles. The non-commercial mechanical/prescribed fire treatments proposed under Alternatives B and C in this EA would not impact the mature trees that great gray owls prefer. Commercial timber harvest would disrupt/remove potential great gray owl nesting habitat. If an active great gray owl nest is located within a treatment unit, a timing stipulation would be implemented for activity to occur outside of nesting season and a no-cut buffer would

potentially be applied. While individuals or habitat may be impacted, effects would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Greater Sage Grouse:

BLM administered land in the RRLW has roughly 19,291 acres (28%) in sage grouse priority habitat management areas (PHMA) and 36,772 acres (53%) in sage grouse general habitat management areas (GHMA) (see Map 2). The watershed provides year-round sage grouse habitat, with most public land habitat in the Snowline and Henneberry Ridge areas. There are two sage grouse leks within one mile of each other near Henneberry Ridge and one lek near Snowline. Counts of male sage grouse attendance at these leks have been relatively stable over nearly two decades. Birds using the Henneberry Ridge leks are likely non-migratory, with movements around five to ten miles into seasonal habitats. Sage grouse in the watershed seasonally move into Idaho and birds from Idaho also move into Montana.

Sagebrush is an important habitat component for sage grouse. It comprises nearly 100% of sage grouse winter diets and provides thermal, hiding, and nesting cover. "Suitable" summer/late brood-rearing habitat guidelines include: 10-25% sagebrush cover, 40-80 cm sagebrush height, and ≥15% perennial grass and forb cover (combined). During nesting/early brood rearing, suitable habitat also includes ≥18 cm perennial grass and forb height and ≥5% perennial forb cover, 15-25% sagebrush cover, 30-80 cm sagebrush height, and ≥10% perennial grass cover. HAF plot data gathered between mid-June and mid-July, 2017 found that shrub cover ranged from 0-48%, and 77% of habitat plots had shrub cover >25%. Shrub height ranged from 0-74 cm, and 77% of plots had shrub height between 30-80 cm. Perennial grass cover ranged from 36-83%, and 100% of plots had ≥10% perennial grass cover. Perennial grass height ranged from 11-40 cm, with over 92% of plots ≥18 cm. Perennial forb cover ranged from 1-49%, and over 92% of plots had forb cover ≥5% and one plot had <3%.

Under Alternative A, current riparian conditions would not improve on allotments that did not meet the riparian standards. Allotments, such as Snowline AMP, that did not meet the riparian standard may have reduced quality and/or quantity of sage grouse brood-rearing habitat. Implementing the proposed grazing management changes to improve riparian conditions and the riparian, wetland, and aquatic habitat enhancement or restoration projects would improve brood-rearing habitat, including an increase in forbs and insects essential to brood diets. The removal of livestock grazing, as proposed under Alternative D on the Pine Butte Pasture in Snowline AMP, would increase herbaceous cover within the allotment, and likely increase forb availability for potential sage grouse use. However, a reasonably foreseeable action would be the permittee fencing out private and DNRC lands to continue grazing the area. This would add around 3.3 miles of fence to the landscape, within the PHMA. The construction of fences proposed under Alternatives B and C create collision hazards for sage grouse who may fly into the wires. Marking fences in areas where sage grouse concentrate (i.e. within ¼ mile of a lek and/or winter concentration areas; considering topography, vegetation, visibility, etc that may reduce visibility) increases fence visibility, reducing likelihood of collision. Not all fences can be marked on the landscape, and continue to be collision risks. See Chapter 4, Resource Concern #1: Special Status Species and Big Game Habitat, Effects Common to All Alternatives, for further discussion about livestock grazing and sage grouse.

Non-commercial mechanical/prescribed fire treatments proposed under Alternatives B and C would cause a short-term loss of sagebrush cover in the treated areas. However, sagebrush cover is currently reduced or close to elimination within these treatment units, and implementing these treatments creates potential for sagebrush habitat to return for the long-term rather than continuing the current trend towards transitioning into juniper or Douglas-fir habitat. Boyd et al. (2017a) estimate that "*fire has twice the treatment life of cutting at time horizons approaching 100 years, but has high up-front conservation costs due to temporary loss of sagebrush. Cutting has less up-front conservation costs because sagebrush is unaffected, but it is more expensive over longer management time horizons because of decreased durability. Utilizing a combination of fire and cutting treatments is most financially and ecologically sustainable over long time horizons in managing conifer-prone sage grouse habitat*." Of the 1,186 acres proposed for non-commercial mechanical/prescribed fire units in Alternative B, approximately 628 acres are within a sage grouse GHMA. This comprises roughly 1.7% of BLM administered GHMA and 0.53% of total GHMA acreage in the RRLW. Of the 1,913 acres proposed for non-commercial mechanical/prescribed fire units in Alternative C, approximately 1,355 acres are within a sage grouse GHMA. This comprises roughly 3.7% of BLM administered GHMA and 1.2% of total GHMA acreage in the RRLW. Baruch-Mordo et al. (2013) found that sage grouse incur population-level impacts at a very low level of conifer expansion, as no leks were active in areas where conifer canopy cover exceeded 4%. Severson et al. (2016) found that the relative probability of sage grouse nesting was negatively associated with >3% conifer cover within 800 meters of nests. Female sage grouse were 43% more likely to nest within 1000 meters of areas where conifers had been removed, with 29% of the radio-collared population moving to nest in mountain big sagebrush habitats that were cleared of encroaching conifers (Severson et al. 2017a). Increases of 6.6% annual female survival and 18.8% nest survival relative to the control area were documented where conifers were removed (Severson et al. 2017b).

Since all of the units being treated for conifer expansion are unsuitable sage grouse habitat, hens are unlikely to use these areas for nesting and brood-rearing. Proposed treatment units are at least six miles from the nearest leks. Due to the conifer expansion creating unsuitable habitat and deterring sage grouse from using the treatment units, disturbance to sage grouse within these units is unlikely. Since sage grouse are using habitat within the allotments with sagebrush cover that is higher than objectives and herbaceous understory is still meeting objectives, these areas were not proposed for sagebrush thinning treatments. These areas will continue to have sagebrush cover that exceeds objectives. While individuals and habitat may be impacted, treatments and alternatives proposed in this EA would not contribute to a trend towards federal listing or cause a loss of viability to the population or species. Overall, utilizing mechanical/prescribed fire treatments would transition this habitat that is currently unsuitable for sage grouse into more suitable seasonal sage grouse habitat in the long-term. Without treatment this would continue to transition into forested/juniper habitat and not be suitable for sage grouse. See Chapter 4, Resource Concern #1: Special Status Species and Big Game Habitat, Effects Common to Action Alternatives, for further discussion about conifer expansion and sage grouse. Alternatives proposed in this EA may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Lewis's Woodpecker

Lewis's Woodpecker breeding habitat includes open forest and woodland, often logged or burned, including coniferous forest; primarily ponderosa pine (*Pinus ponderosa*), riparian woodland and orchards, and less commonly in pinyon-juniper. Important

habitat features include an open tree canopy, a brushy understory with ground cover, dead trees for nest cavities, dead or downed woody debris, perch sites, and abundant insects. Unlike other woodpeckers, Lewis's Woodpeckers are not morphologically well adapted to excavate cavities in hard wood. They tend to nest in a natural cavity, abandoned Northern Flicker (*Colaptes auratus*) hole, or previously used cavity. Lewis's Woodpeckers feed on adult emergent insects (e.g., ants, beetles, flies, grasshoppers, tent caterpillars, mayflies) in summer, and ripe fruit and nuts in fall and winter. They are opportunistic and may respond to insect outbreaks and grasshopper swarms by increasing breeding densities. Unlike other woodpeckers, the Lewis's Woodpecker does not bore for insects but will flycatch and glean insects from tree branches or trunks; they also drop from a perch to capture insects on the ground (MNHP, 2018a). Specific needs of the Lewis's Woodpecker at the microsite and site level could be met in the form of interspersed zones of shrubby understory within the overall habitat mosaic (Casey, 2000). The commercial timber harvests proposed in Alternative B may alter potential Lewis's woodpecker habitat, although based on the species' needs, the added mosaic to the landscape may enhance Lewis's woodpecker foraging habitat. Although not documented in the area, individuals or habitat may be affected, but will not likely trend towards federal listing or lose population or species viability.

Long-billed Curlew:

Long-billed curlew populations have declined throughout much of their range (Casey, 2013). The DFO is participating in spring curlew survey efforts organized by MFWP. The long-billed curlew is migratory and arrives in Montana in mid-April. Breeding habitat includes mixed grass prairie habitats and moist meadows, preferring to nest in open, short-statured grasslands and avoiding trees, dense shrubs, or tall, dense grasses (MNHP, 2018a). Curlews are opportunistic foragers, feeding primarily on invertebrates and small vertebrates such as bird eggs and nestlings, foraging in open prairie grasslands and meadows, at the edges of prairie ponds and sloughs (Dugger and Dugger 2002). Virtually all studies have indicated that relatively short graminoid vegetation is among the key habitat variables selected by nesting curlews (Casey, 2013). Livestock grazing, particularly early season grazing, typically has a positive benefit on nesting long-billed curlews, although year-round grazing can be detrimental (Dugger and Dugger, 2002.) Removing livestock grazing under Alternative D on the Pine Butte Pasture of the Snowline AMP may reduce the preferred curlew nesting habitat of short grasses. Improving riparian habitat would improve foraging conditions. While individuals and habitat may be impacted by livestock grazing, even beneficially, the alternatives in this EA would not reduce population or species viability.

McCown's Longspur:

The McCown's longspur is migratory in Montana, arriving in late April to mid-May and leaving in September. Nests are constructed in shallow ground depressions. Nesting habitat is characteristically open with sparse vegetation on semi-arid shortgrass steppe, structurally similar to habitats like overgrazed pastures (With 2010). Grazing may actually benefit McCown's longspur. Removing livestock grazing under Alternative D on the Pine Butte Pasture of the Snowline AMP may reduce the preferred McCown's longspur nesting habitat of sparse vegetation with short grasses. Threats to this species include habitat disruptions like plowing, pesticide use, and suppression of grassland fires that maintain shortgrass prairie (With 2010). McCown's longspur primarily eat grass and forb seeds, insects, and other arthropods. While individuals and habitat may be impacted by livestock grazing, even beneficially, the alternatives in this EA would not reduce population or species viability.

Peregrine Falcon:

Peregrine falcons are migratory in Montana and arrive to breeding areas in late April to early May; departure begins late August-early September. The peregrine falcon was delisted from the list of Endangered and Threatened Species in 1999. Peregrine falcons feed primarily on birds, mostly medium-size passerines up to small waterfowl as well as sage grouse. They have occasionally been reported to prey on small mammals, lizards, fish, or insects. Nests typically are situated on ledges of vertical cliffs, often with a sheltering overhang. Ideal locations include undisturbed areas with a wide view, near water, and close to plentiful prey. There is one known eyrie in RRLW above the Beaverhead River. None of the alternatives in this EA are likely to impact peregrine falcons.

Trumpeter Swan:

Trumpeter swans utilize Clark Canyon Reservoir and DFO's Ducks Unlimited pond at Pipe Organ during migration. Trumpeter swans forage in lakes and ponds on aquatic vegetation and invertebrates. A non-migrating, breeding population of trumpeter swans inhabit the headwaters of the Red Rock River, upstream of the RRLW in the neighboring Centennial Valley on the Red Rock Lakes National Wildlife Refuge (RRLNWR). The RRLNWR was created for trumpeter swan protection and management. None of the proposed alternatives would likely affect trumpeter swans.

Veery:

Veery are summer migrants that breed in moist, low elevation deciduous forests with a dense understory. They are also found in very thick and wide willow or alder shrub riparian habitat near water. Veerys feed on insects, fruit, and spiders. They mostly feed on the ground, swoop from a perch to the ground to capture prey, foliage glean, and occasionally grab insects from the air. Veery are a fairly common host for cowbird parasitism, making them vulnerable to landscape changes and disturbances (Casey, 2000). Over-grazing can lead to an increase in cowbirds which in turn leads to increased parasitism. All of the grazing allotment management plans are managed for moderate grazing and would not have a significant impact. Managing or improving the riparian habitat to meet PFC and increase riparian woody regeneration would be beneficial, including actions for the riparian, wetland, and aquatic habitat enhancement or restoration projects. Riparian conifer removal treatments would increase deciduous riparian vegetation for veery habitat. Alternative D, removing livestock grazing from the Pine Butte Pasture in the Snowline AMP, would reduce livestock impacts to riparian areas and cowbird numbers, potentially benefiting veery. Under the No Action alternative, wildlife habitat in allotments that did not meet riparian/wetland standards would continue to be affected by reduced vegetative and woody cover, vegetative species composition, and structural diversity. Actions proposed in the RRLW may impact individuals or habitat, but would not lead to federal listing or a loss of population or species viability.

Boreal/Western Toad:

Western toad habitat includes low elevation beaver ponds, reservoirs, streams, lake shores, potholes, wet meadows, and marshes, to high elevation ponds, fens, and tarns at or near treeline (MNHP, 2018a). Western toads may wander miles from breeding sites through coniferous forests and subalpine meadows, lakes, ponds, and marshes (Werner et al. 2004). They are active between April and October, with adult's diets consisting of flies, ants, and sometimes smaller individuals of their own species. They breed in any

clean standing water, with mating season between May and July. Breeding habitat may occur within the allotments with various springs, and wetlands. Reduced access by livestock to breeding sites within grazing allotments can prevent undue trampling mortality. Maintaining existing and constructing new livestock exclosures, as well as other measures to maintain or improve riparian health, such as changing livestock management, can benefit breeding populations. Removing livestock grazing from the Pine Butte Pasture in the Snowline AMP under Alternative D would reduce livestock impacts to riparian areas, potentially benefiting western toads. Design features listed in Chapter 2, Features Common to All Action Alternatives, including Montana Forestry Best Management Practices (BMPs) and the State of Montana Streamside Management Zone (SMZ) law and rules, would be followed for all treatments or road construction/maintenance activities in or near riparian areas. These precautions would protect potential breeding sites during commercial timber harvest implementation. While individuals and habitat may be impacted, impacts would not likely contribute to federal listing or cause a loss of viability to the population or species.

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Appendix D
Biological Evaluation for
Special Status Plants on BLM Lands in the Red Rock Lima Watershed
(Red Rock Lima Watershed Environmental Assessment)
DOI-BLM-MT-B050-2018-0009-EA

Prepared by
Kelly Savage, Rangeland Management Specialist/TES Plants
March 2018

None of the plants currently listed as endangered or threatened under the Endangered Species Act inhabit BLM lands in the Dillon Field Office. However, Ute ladies' tresses, which is listed as threatened in Montana, is known to occur on private and state lands in Beaverhead, Madison, Gallatin, and Jefferson counties. Fifteen sensitive plant species (including Whitebark Pine) inhabit BLM-administered lands within the Dillon Field Office. Eight of those species are known to occur within the Cumulative Impact Area of the Red Rock Lima Watershed (RRLW) boundary. The potential effects that the various alternatives may have on these species are summarized in the following table. A detailed discussion of predicted effects and potential impacts to special status plant species and their habitat is provided in the attached "Supplemental Information on Special Status Plants on BLM Lands in the Red Rock Lima Watershed."

Definitions of Abbreviations used in the Table.

NI - No Impact

BI - Beneficial impact to populations or habitat

MIIH - May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

*** WIFV** - Will impact individuals or habitat with a consequence that the action may contribute to a trend toward federal listing or cause a loss of viability to the population or species.

***** Consultation with the U.S. Fish and Wildlife Service will be initiated if an alternative is selected that may contribute to a loss of viability to a population of species reviewed in this evaluation.

Biological Evaluation Summary for Special Status Plants for the Red Rock Lima Watershed Environmental Assessment (DOI-BLM-MT-B050-2018-0009-EA)

Common Name *Genus species*	Does the species occur on Public Lands within the Red Rock Lima Watershed?	Is the species or its habitat found in the Cumulative Impact Area?	Are irreversible or irretrievable resources involved?	What effect could this proposal have? *			
				Alt. A	Alt. B	Alt. C	Alt. D
Ute ladies' tresses *Spiranthes diluvialis*	NO	NO	--	--			
Cusick's horse-mint *Agastache cusickii*	NO	NO	--	--			
Sapphire rockcress *Arabis fecunda*	NO	NO	--	--			
Painted milkvetch *Astragalus ceramicus var. apus*	NO	NO	--	--			
Bitterroot milkvetch *Astragalus scaphoides*	YES	YES	NO	MIIH	BI	MIIH	N/A
Railhead milkvetch *Astragalus terminalis*	YES	YES	NO	MIIH	BI	MIIH	N/A
Idaho sedge *Carex idahoa*	YES	YES	NO	MIIH			
Fendler cat's-eye *Cryptantha fendleri*	NO	NO	--	--			
Lemhi penstemon *Penstemon lemhiensis*	YES	YES	NO	MIIH	BI	MIIH	N/A
Beautiful bladderpod *Lesquerella pulchella*	NO	NO	--	--			
Sand wildrye *Leymus flavescens*	NO	NO	--	--			
Alkali primrose *Primula alcalina*	YES	YES	NO	MIIH			
Silver chicken sage *Sphaeromeria argentea*	YES	YES	NO	NI			
Meadow lousewort *Pedicularis crenulata*	YES	YES	NO	MIIH			

* The livestock management and project proposals are not consistent across alternatives. For example, the season of use for one allotment under Alternative B may not be the same as the season of use for another allotment under the same alternative. For the purposes of this biological evaluation if a proposed grazing treatment (numbers, duration, time of year, frequency of rest), project or vegetative treatment within a given alternative is likely to adversely affect a sensitive plant or its habitat, then that effect is reflected in the table.

Supplemental Information on Special Status Plants on BLM Lands in the Red Rock Lima Watershed

The Dillon Resource Management Plan provides guidance that requires project sites in high probability habitats to be surveyed for sensitive plants prior to any ground disturbing activities. This reduces the possibility that sensitive plant species would be accidentally or inadvertently impacted by BLM activities.

Bitterroot milkvetch (*Astragalus scaphoides),* railhead milkvetch (*Astragalus terminalis*), and Lemhi beardtongue (*Penstemon lemhiensis)* are palatable and are sensitive to intensive grazing, especially during spring and early summer. Repeated herbivory, particularly between mid-May and mid-July may lead to population declines. Rest-rotation grazing regimes may allow enough recruitment to maintain stable populations of these palatable sensitive plants.

Trend monitoring for Bitterroot milkvetch (*Astragalus scaphoides*) was established in the Cedar Creek and Shoshone Cove allotments in June, 2009. These sites were monitored again May 31, 2017. The data collected showed an overall reduction in number of Bitterroot milkvetch plants and an increase on herbivory of reproductive plants. Herbivory was from both cattle and wildlife; the Cedar Creek allotment had not been visited by cattle yet when monitoring data was collected in 2017. Strictly following an early, late, rest grazing rotation in each allotment is important for this species. The dormant season grazing that is proposed in alternative B would be beneficial not only for Bitterroot milkvetch but also Lemhi beardtongue and railhead milkvetch. Annual monitoring at these sites is recommended rather than every ten years as annual precipitation/weather can affect the population dramatically each year. The annual monitoring will provide more accurate data to determine the trend of these populations.

Idaho sedge (*Carex idahoa*) is found in a few different riparian habitat locations throughout the RRLW. It is found in wet to moist alkaline meadows, is palatable, and sensitive to intensive grazing, especially during spring and early summer. Repeated herbivory, particularly between mid-May and mid-July may lead to population declines. Alternatives that increase the frequency of rest or shorten the duration of grazing on these habitats would reduce the opportunity for soil compaction and may contribute to increased vigor and production of native graminoids, including Idaho sedge. Kentucky bluegrass and common dandelion are present in most wet meadow habitat and along many stream reaches. Kentucky bluegrass may compete with Idaho sedge. Canada thistle and houndstongue are scattered throughout the RRLW and were observed in many riparian and wetland habitats, especially along intermittent stream reaches. These noxious weeds may also compete with Idaho sedge which prefers these streamside and meadow habitats.

Alkali primrose (*Primula alcalina*) is found in moist to wet alkaline meadows near headwaters streams at 6,300 to 7,200 feet elevation. Alkali primrose has not been yet documented on BLM administered lands within the RRLW boundary but it has been documented on private lands within the watershed boundary and it has also been documented on BLM lands in adjacent

watersheds so there is potential habitat on BLM lands within RRLW as well. Habitat for this species appears to be restricted to wet meadow habitats associated with relatively stable water tables. Soils remain moist to saturated throughout the growing season, but there is little or no inundation. The density of Alkali primrose declines with increased abundance of rhizomatous graminoids such as sedge and rushes. It is often most abundant on the tops and sides of hummocks where little other vegetation is present. Hummock habitats are moist without being wet and are more open than the wetter microhabitats dominated by sedges and rushes. Livestock congregate near wetlands in the summer for the lush vegetation and proximity to water. The effects of livestock grazing on Alkali primrose are both positive and negative. Because the leaves of Alkali primrose are all at ground level, livestock grazing can prevent seed production, however it will not kill the plant or remove significant photosynthetic tissue. Grazing can also be positive by partially removing the overtopping canopy of grasses and sedges, allowing more light to reach the leaf rosettes. Livestock grazing can also indirectly affect wetland vegetation by altering hydrologic regimes. Trampling by livestock may benefit this species by creating microhabitats on the tops and sides of the hummocks. Loss of wetlands would likely result in population declines. This can be minimized by restricting livestock grazing to later summer in as many years as possible to reduce trampling and grazing in these hummocked wetland habitats.

Chicken sage (*Sphaeromeria argentea*) prefers sparsely vegetated habitats with low competition. The known populations of this plant species, in the RRLW, face no anthropogenic threats. They appear to tolerate and may benefit from disturbances that reduce competition such as livestock grazing.

Between the time of writing the RRLW assessment report and this EA one more sensitive plant species was added to the DFO Special Status Plants list by the MT state office botanist. This species is Meadow lousewort (*Pedicularis crenulata*). It is not on the official sensitive plant list yet but will be added when the list is updated in the near future. There is only one known population of meadow lousewort (*Pedicularis crenulata*) in the DFO and it is in the RRLW on BLM administered lands along the Beaverhead River where no grazing by livestock occurs currently. The population is known to occur in the vicinity of a BLM administered recreation site. Activities such as mowing and weed spraying should be limited or avoided during the plants phenology from June to August. While individuals of this species may not be directly affected by any of the alternatives, habitat that could support this species could be affected by all alternatives. Alternatives that increase the frequency of rest or shorten the duration of grazing on wetland habitats where this species could occur would reduce the opportunity for soil compaction and may contribute to increased vigor and abundance of meadow lousewort and other plant species that inhabit these wetland sites. A more complete inventory will be completed during the summer of 2018 for this species.

During the summer of 2010, the U.S. Fish and Wildlife Service announced a 90-day finding on a petition to list whitebark pine (*Pinus albicaulis*) as endangered or threatened and to designate critical habitat. In July of 2011, the finding was released; whitebark was given a warranted but precluded listing. The most recent review of the species status of whitebark pine was in

December of 2015. The FWS lowered the priority from 2 to 8. For background, each candidate species is assigned a priority number from 1 to 12 based on factors such as the magnitude of threats facing the species, the immediacy of the threat and the species' taxonomic status. A lower priority number means that the species is under greater threat. For example, a number of 2 indicate a higher degree of concern than a number of 8. The basis for this change in listing priority for whitebark pine is due to the reduced magnitude of the threat from mountain pine beetle; the beetle epidemic appears to be subsiding, and the Service no longer considers this threat to be having the high level of impact that was seen in recent years."(Endangered and Threatened Wildlife and Plants, 2015).

For more of a discussion about whitebark pine in the RRLW see Forest and Woodland Habitat section in chapter 3

Cumulative Considerations:
High probability habitats will be surveyed for sensitive plants prior to any ground disturbing activities on federal land but botanical surveys aren't required on private and state lands even on cooperative projects (e.g. a pipeline that crosses multiple ownerships). It's possible that sensitive plant species could be accidentally or inadvertently impacted by construction or placement of range improvement projects on non-federal lands.

The invasion of introduced species and noxious weeds near and into special plant species habitat across all ownerships poses a direct threat to these plants through competition, habitat degradation and the potential impact of herbicides. The use of insecticides on private lands within the RRLW to control grasshoppers or other insects may affect pollinators that visit plant species on BLM lands.

Kelly Savage *5/12/2018*

Signature Date

Printed Name and Title: Kelly Savage, Rangeland Management Specialist/TES Plants

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Appendix E

Riparian and Water Quality

Table 1. List of Identified Riparian, Wetland, Aquatic Habitat and Water Quality Restoration/Improvement Projects

Project Area	Allotment	Programmatic Action Category	Description	Project Metrics
Reach 941, Junction Creek	Snowline AMP	Riparian Planting	Consider planting willow along reach following fence realignment.	0.9 miles
Reach 904, Junction Creek Trib	Snowline AMP	Grade Control, Headcut Stabilization, Water spreading/slowing structures, De-hummocking	Manipulate abandoned check dams to halt headcuts and to slow/spread flow; place grade control where gullying has occurred throughout; reduce hummocks as access allows; move flow out of gully in the lower portion of drainage.	37 acres
Reach 946, East Fork Beaver Creek	Snowline AMP Custodial	Grade Control, Headcut Stabilization, Water spreading/slowing structures	Severely entrenched channel. Use sod mats to install grade control through out. Headcut stabilization needed both on BLM and on private downstream.	0.5 miles BLM + unknown private
Reach 913, East Fork Little Sheep Creek	Lima Peaks	Channel Relocation	Remove flow from road and return to the native channel.	0.3 miles
Reach 13, Upper Bill Hill Creek	Gallagher MTN AMP	NA	Road work to improve run-off patterns	NA
Reach 14, Lower Bill Hill Creek	Gallagher	Stream Crossing Improvement, Headcut Stabilization, Channel relocation, grade	The mesic tributary that is the lumped with Reach 14 needs grade control, water slowing and spreading structures. The road crossing has a misplaced culvert that is causing severe	0.5 miles mesic, 200 yards for crossing improvement

Project Area	Allotment	Programmatic Action Category	Description	Project Metrics
		control, Water slowing and spreading structures.	erosion of uplands and sedimentation of the stream.	
Clark Canyon Creek	Clark Canyon, Clark Canyon Isolated	Induced Meandering, Grade Control, Headcut stabilization, Floodplain grading, water slowing and spreading structures.	Within Clark Canyon evaluate opportunity to reconnect or reestablish floodplains and alluvial fans. Refer to past studies to identify and implement opportunities to improve sediment and water storage within the watershed.	unknown
Henneberry Ridge Road	Cedar Creek, Shoshone Cove	Grade Control, Headcut stabilization	Comprehensive drainage improvement plan need for the Henneberry Ridge road. Gullying that has resulted from poor runoff routing needs to be stabilized.	NA

*The programmatic actions listed for each project are only a list of potential actions. Project design has not been completed and projects would not be limited to this list.

Table 2. Functional Status of Lotic Riparian Reaches within the RRLW Assessment Area

Reach Name	BLM Reach Number	Allotment	Functional Rating	Miles
Beaverhead R	2	Gallagher	PFC	2.6
Bill Hill	13	Gallagher Mtn AMP	PFC	0.7
Bill Hill	14	Gallagher	FAR	1.5
Gallagher Trib	22	Gallagher Mtn AMP	PFC	0.7
Gallagher	23	Gallagher Mtn AMP	FAR-UP	1.9
Gallagher	24	Gallagher	PFC	0.7
Gallagher	25	Gallagher	FAR-UP	0.7
Gallagher	26	Gallagher	PFC	0.8
Gallagher Trib	28	Gallagher Mtn AMP	PFC	0.3
Beaverhead trib	71	Gallagher	PFC	0.4
Lovells Gulch	80	Gallagher Mtn AMP	FAR	0.7
Little Basin Canyon	81	Gallagher Mtn AMP	PFC	0.5
Bell Canyon	900	Bell Canyon	PFC	0.8

Reach Name	BLM Reach Number	Allotment	Functional Rating	Miles
Cedar Creek	901	Cedar Creek	FAR-UP	1.7
Bell Canyon	902	Bell Canyon	PFC	0.3
Dutch Hollow	905	Lima Peaks	PFC	0.9
Dutch Hollow	906	Snowline AMP	FAR-UP	0.6
Dutch Hollow	907	Snowline AMP	PFC	0.1
Junction	910	Snowline AMP	PFC	0.5
Junction	911	Snowline AMP	PFC	0.3
Little Sheep EF	912	Lima Peaks	PFC	0.5
Little Sheep EF	913	Lima Peaks	NF	0.3
Little Sheep EF	914	Lima Peaks	PFC	1.7
Little Sheep	915	Little Sheep	PFC	0.2
Spring G	925	Cedar Creek	FAR-UP	0.8
Clark Canyon	926	Clark Canyon Isolated	FAR	0.3
Clark Canyon	927	Clark Canyon	PFC	0.8
Clark Canyon EF	928	Clark Canyon	PFC	0.4
Clark Canyon	929	Clark Canyon	PFC	0.3
Clark Canyon Trib	930	Clark Canyon	PFC	0.6
Bell Canyon trib	931	Bell Canyon	PFC	0.1
Junction Trib	933	Phalarope West	PFC	0.3
Dutch Hollow	937	Lima Peaks	PFC	0.5
Junction	939	Snowline AMP Custodial	PFC	0.7
Junction	941	Snowline AMP Custodial	FAR	0.9
Junction Trib	945	Snowline AMP	FAR	0.2
Big Beaver EF	946	Snowline AMP Custodial	FAR-DN	0.5
Clark Canyon	949	Clark Canyon	FAR-DN	0.3
Clark Canyon	950	Clark Canyon	PFC	1.0
Clark Canyon Trib	951	Clark Canyon	PFC	0.5
Poison Gulch	952	Clark Canyon	PFC	0.4
Whiskey Draw	953	Clark Canyon	PFC	1.3
Clark Canyon	980	Clark Canyon	PFC	1.0
Maurer	983	Roe	PFC	0.3
Limekiln Canyon N	985	Bell Canyon	PFC	0.3
Clark Canyon Trib	986	Clark Canyon	PFC	2.0
Clark Canyon Cr Upper	988	Gallagher Mtn AMP	PFC	0.5

Reach Name	BLM Reach Number	Allotment	Functional Rating	Miles
MF Gallagher Creek Trib	990	Gallagher Mtn AMP	PFC	1.0
Lower Junction Trib	993	Snowline AMP	FAR	0.4
Beaverhead R	2	Gallagher	PFC	2.6

Table 3. Functional Status of Lentic Riparian Reaches Within the RRLW Assessment Area

BLM Reach Name	BLM Reach Number	Allotment	Functional Rating	Acres
Gravel Pit Pond	5	Gallagher	PFC	0.6
Bill Hill Trib	79	Gallagher	PFC	0.7
Gallagher Butte Pothole	93	Gallagher Mtn AMP	PFC	1.4
Johnson pothole	785	Bell Canyon	PFC	2.9
Junction Trib	904	Snowline AMP	FAR-DN	37.0
Junction Trib	909	Snowline AMP	FAR-UP	8.9
Junction	943	Unalloted	PFC	17.4
Ney Ranch Wetland	2401	Gallagher/Unavailable	PFC	329.5

Table 4. Developed Springs within the RRLW Assessment Area

Spring Name	Project Number	Allotment
Leonard Spring#2	P004871	Clark Canyon
Cedar Hill Spring	P0006732	Cedar Creek
Upper Bill Hill Spring	7319	Gallagher
Beacon Spring	P0007178	Gallagher
Bathtub Spring	P047179	Gallagher
Pipe Organ Spring	P470354	Gallagher
Truck Box Spring	P477206	Gallagher
Bill Hill Spring	477205	Gallagher
Dry Slope Spring	P0000313	Roe
Maurer Spring	P0000177	Roe
Maurer Spring/Pipeline	P0004939	Roe
Leonard Spring	P0000200	Clark Canyon
Gordon Brothers Spring	P0000368	Clark Canyon
Horse Mtn Spring#1	P0000713	Clark Canyon
Horse Mtn Spring#2	P0000714	Clark Canyon
Clark Canyon Spring#1	P0000716	Clark Canyon

Spring Name	Project Number	Allotment
Rye Grass Spring	P0004772	Clark Canyon
Buffalo Spring	P0004787	Clark Canyon
Clark Canyon Spring#2	P474814	Clark Canyon
Clark Canyon Spring#3	P0006228	Clark Canyon
Horse Mtn Spring#3	P0006236	Clark Canyon
Two Badger Spring	7689	Gallagher Mtn AMP
Gallagher Mtn Spring#1	P474809	Gallagher Mtn AMP
Gallagher Mtn Spring#2	P477810	Gallagher Mtn AMP
Mountain Top Spring	P0004818	Snowline AMP
Snowline Spring#2	P0000673	Snowline AMP
Snowline Spring#1	P0000660	Snowline AMP
Snowline Spring#3	P0000674	Snowline AMP
CRMP Spring	P0007315	Snowline AMP
East Creek Spring	P0006901	Lima Peaks

Table 5 Cumulative Change in Dominant Cover Composition Following Riparian Conifer Removal.

From modified greenline data collected pre-work (2008) and post (2015) on eight reaches. Reaches are located in the South Tobacco Roots and Blacktail Watershed Assessment Areas		
	Average % Change	**Cumulative % change**
Sedge (canopy >70%)	7.9%	62.8%
Sedge/Rush/Grass Mix (25-70% canopy)	-11.4%	-91.4%
Grass /Forb Mix (<25% sedge/rush mix)	-15.6%	-124.9%
Riparian Shrub (willows, dogwood, aspen, cottonwood,etc.)	25.8%	204.4%
Mesic Shrub (shrubby cinquefoil, rose, chokecherry, etc.)	4.2%	33.5%
Upland Shrub (Juniper, Sagebrush, rabbit brush, etc.)	0.3%	2.7%
Bare Soil (<10% vegetative canopy cover)	-6.4%	-51.5%

Water Quality Standard Determination